

SAMSUNG

COLOR MONITOR

CQB4147/CQB4147L (SyncMaster 3Ne)

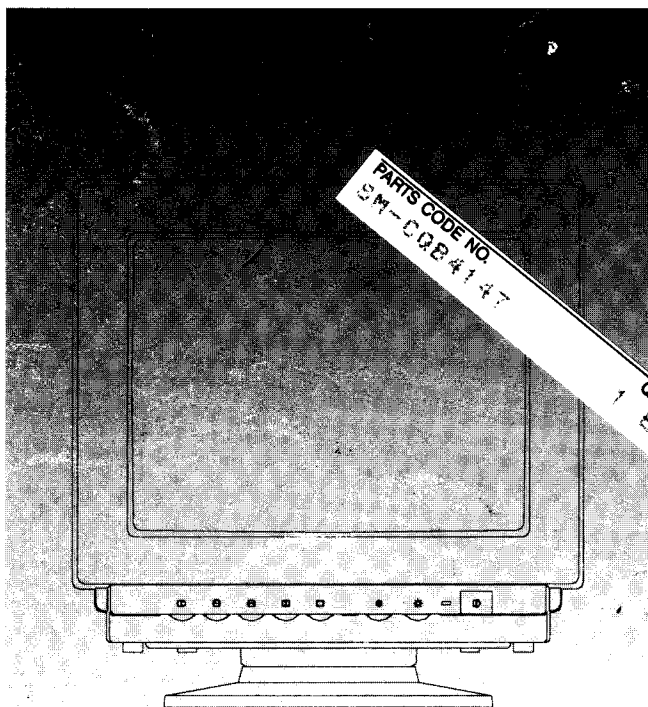
CQB4143/CQB4143L

CQB4157/CQB4157L

CQB4153/CQB4153L

SERVICE Manual

COLOR MONITOR



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1 Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock and X-rays.

1-1 Safety Precautions

1-1-1 Warnings

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power before servicing.
3. When the chassis is operating, semiconductor heat sinks are potential shock hazards.

1-1-2 Servicing the High Voltage System and Picture Tube

1. When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (Disconnect the AC line cord from the AC outlet.)
2. Do not lift the picture tube by the neck.
3. Handle the picture tube only when wearing shatterproof goggles and after completely discharging the high voltage anode.

1-1-3 X-Rays and High Voltage Limits

1. Keep the high voltage below the specified maximum level. Be sure all service personnel are aware of the procedures and instructions covering X-rays.
The only potential source of X-ray in current solid state display monitors is the tube. However, the picture tube does not emit measurable X-ray radiation if the high voltage is as specified in the fire and shock hazard instruction. Only when high voltage is excessive are X-rays capable of penetrating the shell of the picture tube, including the lead in glass material.
2. It is essential that service technicians have an accurate high voltage meter available at all times. Check the calibration of this meter periodically.

3. High voltage should always be kept at the rated value, no higher. Operation at high voltages may cause failure of the picture tube or high voltage circuitry and, also under certain conditions, may produce X-rays in excess of acceptable levels.
4. When the high voltage regulator is operating properly, there is no possibility of an X-ray problem. Test the brightness and use a meter to monitor the high voltage each time a color monitor comes in for service. Make sure the high voltage does not exceed its specified value and that it is regulating correctly.
5. The picture tube is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the picture tube only with one that is the same type or equivalent as the original. Carefully reinstall the picture tube shields and mounting hardware; these also provide X-ray protection.
6. When troubleshooting a monitor with excessively high voltage, avoid being unnecessarily close to the monitor. Do not operate the monitor longer than is necessary to locate the cause of excessive voltage.

1-1-4 Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment cover or shields, isolation resistor-capacitor networks, mechanical insulators, etc.

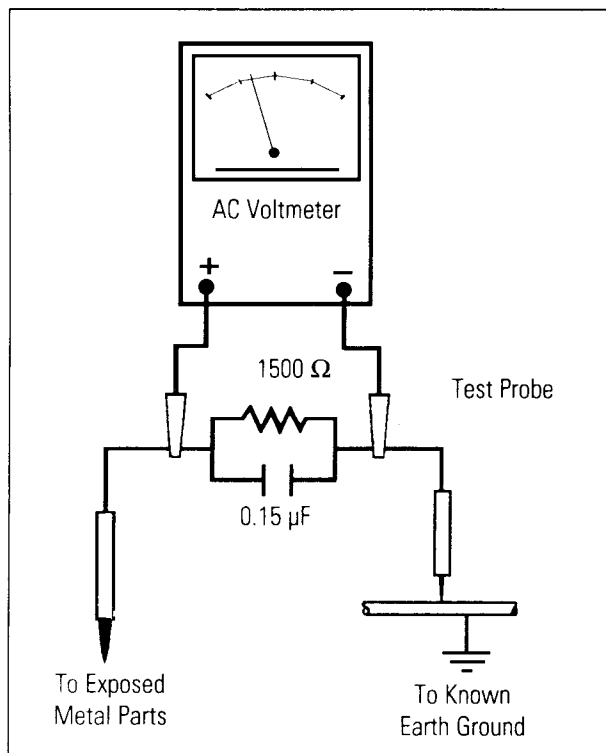


Figure1-1. Leakage Current Test Circuit

3. To be sure that no shock hazard exists, check for leakage current in the following manner:
 - a. Plug the AC line cord directly into a 120 Volt AC outlet. (Do not use an isolation transformer for this test)
 - b. Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15μF capacitor in series with an exposed metal cabinet part and a known earth ground, such as an electrical conduit or electrical ground connected to an earth ground.
 - c. Use a SSVM or VOM with 1000 ohms per-volt or higher sensitivity to measure the AC voltage drop across the resistor (see Figure 1-1).
 - d. Connect the resistor to an exposed metal part having a return path to the chassis (metal cabinet, screw heads, knobs, shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.
 - e. Any reading of 5.25 Volt RMS (this corresponds to 3.5 milliamperes AC) or more is excessive and indicates a potential shock hazard. Correct the shock hazard before returning the monitor to the user.

1-1-5 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and / or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2 Servicing Precautions

Warning: An electrolytic capacitor installed with the wrong polarity might explode.

Caution: Before servicing instruments covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.


1-2-1 General Servicing Precautions

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) remove or reinstall any component or assembly, (b) disconnect all electrical plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.

The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

1-3 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.
9.  marks parts for ESDs on schematic diagrams and electrical parts list.

Caution : Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

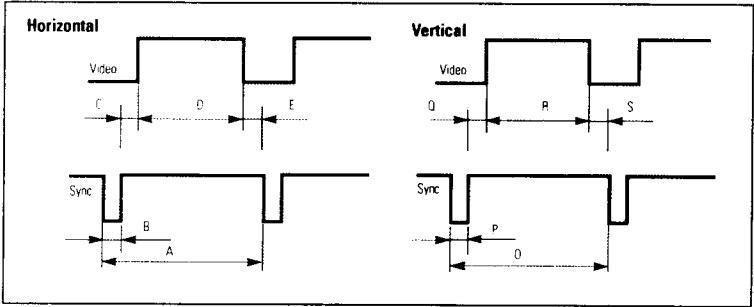
2 Reference Information

2-1 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

Table 4-1. Timing Chart

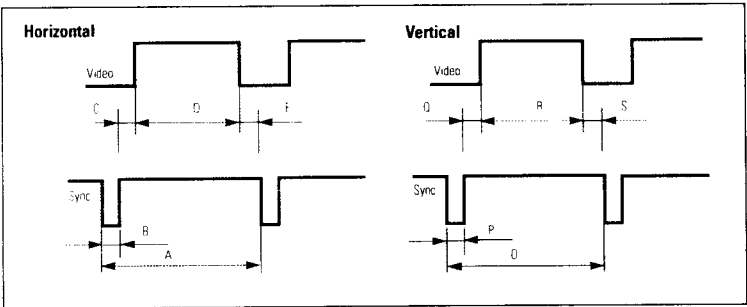
Mode Timing	IBM				VESA		
	VGA1/70 Hz 640x350	VGA2/70 Hz 720x400	VGA3/60 Hz 640x480	XGA87hz 1024x768	640/72 Hz 640x480	640/75 Hz 640x480	800/56 Hz 800x600
fH (kHz)	31.469	31.469	31.469	35.522	37.861	37.500	35.156
A μsec	31.778	31.778	31.778	28.151	26.413	26.667	28.444
B μsec	3.813	3.813	3.813	3.920	1.270	2.032	2.000
C μsec	1.907	1.907	1.907	1.247	4.064	3.810	3.556
D μsec	25.422	25.422	25.422	22.806	20.317	20.317	22.222
E μsec	0.636	0.636	0.636	0.178	0.762	0.508	0.667
fV (Hz)	70.087	70.087	59.940	86.958	72.809	75.000	56.250
O msec	14.268	14.268	16.683	11.500	13.735	13.333	17.778
P msec	0.064	0.064	0.064	0.113	0.079	0.080	0.057
Q msec	1.907	1.080	1.048	0.563	0.739	0.427	0.626
R msec	11.122	12.711	15.253	10.810	12.678	12.800	17.067
S msec	1.176	0.413	0.318	0.014	0.237	0.027	0.028
Clock Frequency (MHz)	25.175	28.322	25.175	44.900	31.500	31.500	36.000
Polarity H.Sync V.Sync	Positive Negative	Negative Positive	Negative Negative	Positive Positive	Negative Negative	Negative Negative	Neg/Pos Neg/Pos
Remark	Separate	Separate	Separate	Separate	Separate	Separate	Separate



A : Line time total	O : Frame time total
B : Sync width	P : Sync with
C : Back porch	Q : Back porch
D : Active time	R : Active time
E : Front porch	S : Front porch

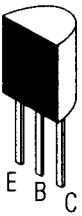
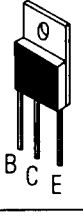
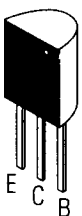




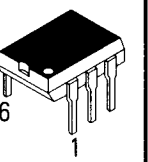

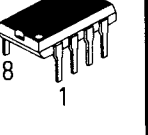
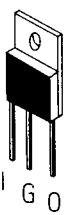
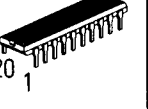
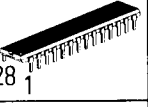
Table 4-2. Timing Chart

Mode Timing	VESA		
	800/60 Hz 800x600	800/75Hz 800x600	1024/60Hz 1024x768
fH (kHz)	37.879	46.875	48.363
A μsec	26.400	21.333	20.677
B μsec	3.200	1.616	2.092
C μsec	2.200	3.232	2.462
D μsec	20.000	16.162	15.754
E μsec	1.000	0.323	0.369
fV (Hz)	60.317	75.000	60.004
O msec	16.579	13.333	16.666
P msec	0.106	0.064	0.124
Q msec	0.607	0.448	0.600
R msec	15.840	12.800	15.880
S msec	0.026	0.021	0.062
Clock Frequency (MHz)	40.000	49.500	65.000
Polarity H.Sync V.Sync	Positive Positive	Positive Positive	Negative Negative
Remark	Separate	Separate	Separate



A : Line time total	O : Frame time total
B : Sync width	P : Sync width
C : Back porch	Q : Back porch
D : Active time	R : Active time
E : Front porch	S : Front porch

2-2 Semiconductor Lead Identification

PARTS	TYPE NO.	REF. NO.	PARTS	TYPE NO.	REF. NO.
	KSC1008-Y	Q404		KSC1507 2SC3503 KSC3503	Q603
	VN2222LL VN0606M	Q205			
	KSC945C-Y KTC1398-Y	Q201, Q202, Q203, Q204, Q206, Q402, Q409, Q502, Q601, Q607		IRF9610	Q408
	KSC733C-Y KTA1266-Y	Q401, Q405, Q407, Q410, Q501		2SK1351 IRF740	Q412
				IRF630	Q413
	2SC4744 2SC4762 KSC5086 2SC5149 KSC5386	Q403		TDA8351	IC301
	6N80 2SK1358 SST6N80	Q602		CQY80-NG CQY80-XG	OP601
				KA3882	IC601
	MJE800 KSE800	Q406		24LC21/P	IC701
				TDA4850	IC401
	MC7805 KA7805 KIA7805P	IC202		SL606	IC201
	KA317 LM317	IC603		LM1203 KA2139	IC101
				LM2406T	IC102

3 Product Specifications

3-1 Specifications

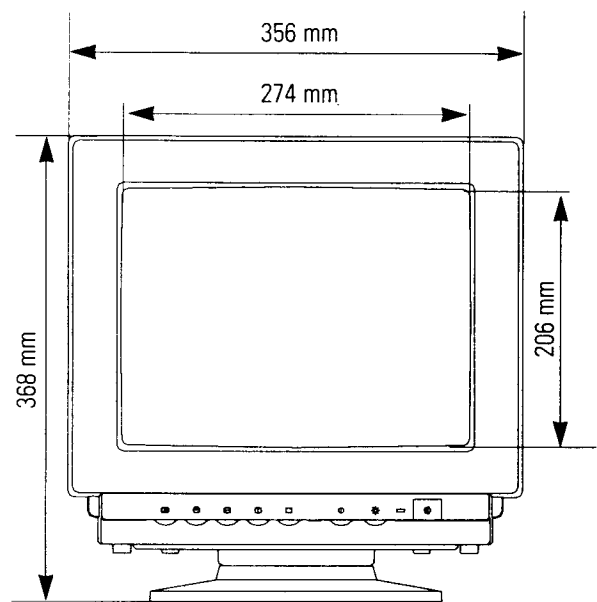
Item \ Model	CQB4147/CQB4157	CQB4143/CQB4153
Picture Tube:	14-inch (36 Cm), 13.2-inch (33.5Cm) visual; Full square/regular face tube, 90° Deflection; Antistatic silica coating; AK shadow mask	
	0.28 mm Dot pitch; Non-glare	0.39 mm Dot pitch; Non-glare
Scanning Frequency Horizontal / Vertical	31.47kHz/70 Hz, 31.47kHz/60 Hz, 35.52kHz/87 Hz, 37.5kHz/75 Hz, 37.86kHz/72.8 Hz, 35.16kHz/56 Hz, 37.88kHz/60.3 Hz, 46.88kHz/75Hz, 48.36kHz/60.00Hz	
Display Colors Analog Input	Unlimited Colors	
Maximum Resolution	Horizontal : 1024 Dots Vertical : 768 Lines	
Input Signal Video Separate Sync	Analog 0.714 Vp-p Positive at 75 Ω terminated TTL level Positive/Negative	
Maximum Pixel Clock	65 MHz	
Active Display	Horizontal : 255 mm ± 3 mm Vertical : 191 mm ± 3 mm	
Input Voltage	AC 90-264 Volt, 60/50Hz ± 3 Hz	
Power Consumption	80 Watt (max)	
Dimensions	Unit (H x W x D) : 14.5 x 14 x 14.9 Inches (368 x 356 x 379.5 mm) Carton (H x W x D) : 18.2 x 18 x 15.7 Inches (462 x 457 x 398 mm)	
Weight	Net/Gross: 23.2 Lbs (10.5 kg) / 27.6 Lbs (12.5 kg)	
Environmental Considerations	Operating Temperature: 32° F to 104° F (0° C to 40° C) Humidity : 10 % to 80 % Storage Temperature : -4° F to 113° F (-20° C to 45° C) Humidity : 5 % to 95 %	

- Notes :
 1. Designs and specifications are subject to change without prior notice.
Model numbers with an “L” suffix comply with SWEDAC (MPRII) recommendations for reduced electromagnetic fields.
 2. This manual covers the following models:

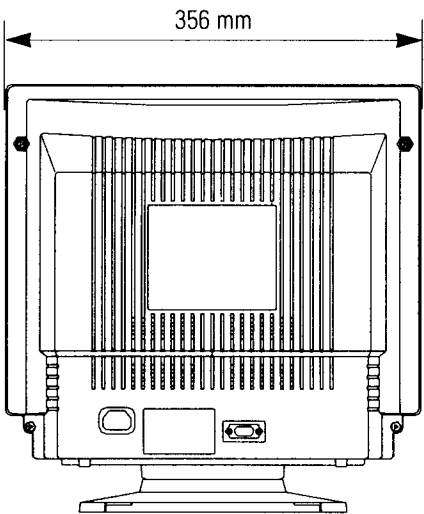
CRT Screen	CRT Dot Pitch	1414 Cabinet		1415 Cabinet	
Non Glare	0.28 mm	CQB4147	CQB4147L	CQB4157	CQB4157L
	0.39 mm	CQB4143	CQB4143L	CQB4153	CQB4153L
Remark	-	-	MPRII	-	MPRII

3-2 Dimensions

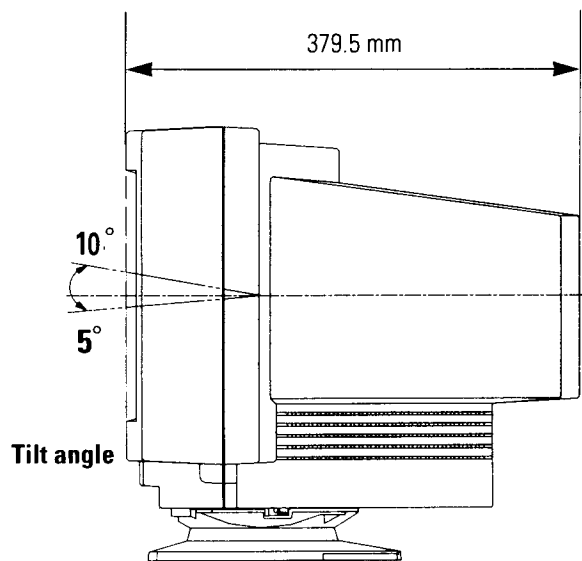
3-2-1 Front View



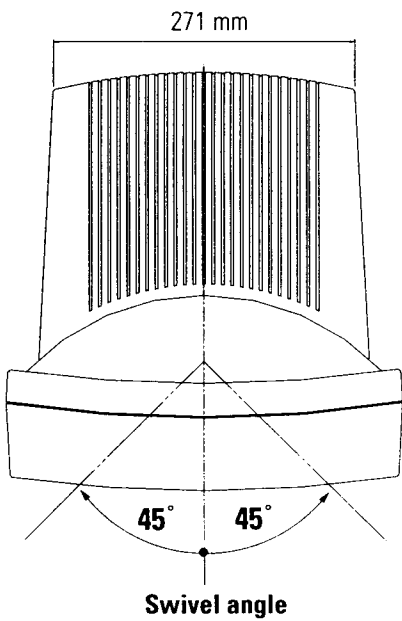
3-2-3 Rear View



3-2-2 Side View



3-2-4 Top View



3-3 Pin Assignments

<div><div></div><div>Pin No.</div></div>	<div>Sync Type</div>	15-Pin Signal Cable Connector (Figure 3-1)
		Separate
1		Red
2		Green
3		Blue
4		GND
5		DDC return
6		GND-R
7		GND-G
8		GND-B
9		Reserved
10		GND-Sync
11		GND
12		DDC Data
13		H-Sync
14		V-Sync
15		DDC Clock

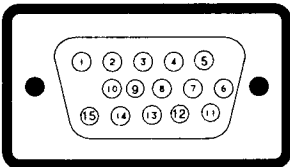
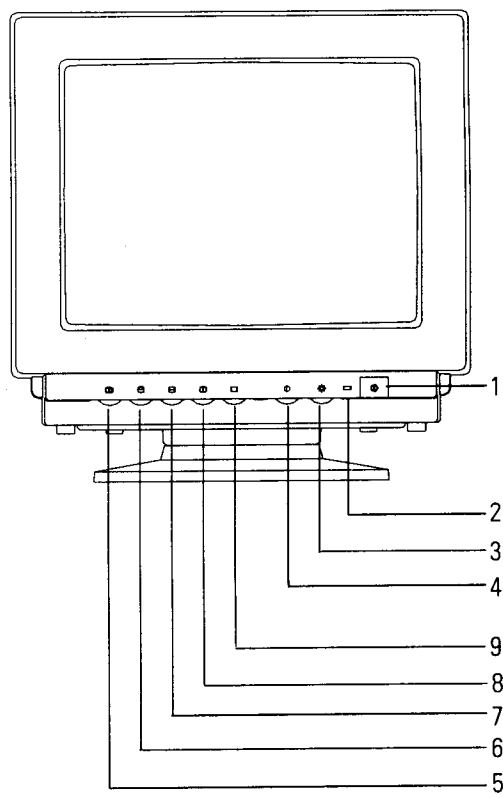


Figure 3-1. Female Type

4 User Controls

4-1 Front View and Controls

4-1-1. Front View



Note 1: When used with a computer equipped with DPMS (VESA), this monitor is EnergyStar compliant.

Note 2: The monitor automatically returns to the normal operation state when horizontal and vertical sync returns. This occurs when you move the mouse or press a key on the keyboard.

Table 4-1. Display Power Management Signaling (DPMS) Standard

State Items	Normal Operation	Power saving function EPA/NUTEK		
		Suspend Mode		Power Off Mode
Horizontal Sync	Active	Inactive	Active	Inactive
Vertical Sync	Active	Active	Inactive	Inactive
Video	Active	Blanked	Blanked	Blanked
Power Indicator	Green	Orange		Orange, Green Blinking
Power Consumption/hr	80W	Less than 15W		Less than 8W

4-1-2 Front Control Panel

Location	Symbol	Description
1		Power Button (Push)
2		Power Indicator LED (Dual Color)
3		Brightness Control
4		Contrast Control
5		Horizontal Position Control
6		Vertical Position Control
7		Horizontal Size Control
8		Vertical Size Control
9		Side Pin Cushion Control

5 Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the CQB41** Series monitors.

WARNING: These monitors contain electrostatically sensitive devices. Use caution when handling any components.

5-1 Disassembly

Caution: Disconnect the monitor from the power source before disassembling the monitor.

5-1-1 Cabinet Disassembly

1. With a pad beneath it, stand the monitor on its front with the screen facing downward and the base closest to you. Make sure nothing will damage the screen.
2. Press in the tab on the Cabinet Bottom and pull the Tilt and Swivel Base upward to remove it.
3. Working from the back of the monitor, remove the four screws.
4. Lift the rear cover up and away from the monitor.
5. Using pinch-nose pliers or long-nose pliers, carefully disconnect the Anode Cap from the CRT.

Caution: Do not touch the anode contact on the CRT.

5-1-2 Disassembling the Stand Assembly

1. Follow steps 1 and 2 in "Cabinet Disassembly," above.
2. With the words "Front" aligned on the Stand Top and Stand Base, rotate the Top counter clockwise, and pull it back to reveal the stopper snap.
3. Press the stopper snap down and continue rotating the Stand Top until Stand Base tab is free in the slot. Pull the Stand Top and Stand Base apart.

5-1-3 Removing the Video PCB

1. Follow steps 1 through 5 in "Cabinet Disassembly," above.
2. Desolder the five tabs on the underside of the Video shield.
3. Remove the Video Shield case.
4. Using a knife, cut through the silicone bond and lift off the Video PCB.

5. Disconnect wire between Video PCB and CRT ground.(CN107)
6. Desolder the CN103, CN104 and Screen wire on Video PCB.
7. Lift the cap on the CRT socket, desolder the Focus wire.
8. Lift the Video PCB and place it on a flat, level surface which is protected from static electricity.

5-1-4 Removing the Main PCB

1. Follow steps 1 through 5 in "Cabinet Disassembly," and steps 1 through 8 in "Removing the Video PCB," above.
2. If you have not already done so, disconnect the Video PCB Assembly from the Main PCB.
3. Disconnect Degaussing Coil at CN601/602 connector on Main PCB.
4. Disconnect both side CRT ground wires at CN403 and GND1. (Normal type)
Disconnect both side CRT ground wires at CN403, GND1 and CN404. (MPRII type)
5. Disconnect DY connector between DY and CN302 on Main PCB.
6. Slide the Main PCB from the Front Cover Ass'y.
7. Remove the Left and Right PCB Brackets.
8. Set the Main PCB on a smooth, level surface protected from static electricity.

5-1-5 CRT Ass'y Disassembly

1. Above procedure must have been done.
2. Straighten Degaussing Coil Assembly coated metal ties and lift Coil Ass'y from the CRT.
3. Remove the four corner screws and lift CRT up and away from the Front cover assembly and place on padded surface.
⚠ Do not lift the CRT by the neck.

Caution: If you will be returning this CRT to the monitor, be sure to place the CRT face down on a protective pad.

5-2 Reassembly

With the CRT facing downward on a protective pad, use the steps that follow to reassemble the monitor.

5-2-1 Replacing the CRT

1. Loop the CRT Ground Ass'y around the back of the CRT and under the four corner metal tabs. Position the corner with the spring last.
2. With the Front Cover Assembly lying face down on a protective pad, position the CRT so that the corner metal tabs fit properly in the Front Cover Assembly.
3. Secure the CRT Ground Ass'y and CRT at each of the four corners with the CRT screws.
4. Replace the Degaussing Coil Assembly and wrap the Coil with the plastic coated metal ties to hold the Coil in place.

5-2-2 Replacing the Main PCB

1. Replace the Left and Right PCB Brackets.
2. Carefully push the Main PCB Ass'y until it is fully inserted and you hear a click as the tabs engage on the Front Cover Ass'y.
3. Reconnect the following connectors and wires:
 - DY connectors (CN302)
 - CRT ground wires
 - Degaussing Coil (CN601,CN602)
 - Anode Cap
4. Main PCB should fit into slots in rear cabinet.

5-2-2 Replacing the Video PCB

1. Reconnect the cap on the CRT socket, solder the FOCUS wire and screen wire.
2. Solder the CN103, CN104 on Video PCB.
3. Reconnect wires between Video PCB and CRT ground.
4. Reconnect CRT socket and CRT pins to apply silicon bond at Plug/Socket junction.
5. Solder the five tabs on the underside of the Video Shield.

5-2-4 Cabinet Reassembly

1. If not already done, re-install the CRT following the directions given in "5-2-1 Replacing the CRT."
2. If not already done, re-install the Main PCB following the directions given in "5-2-2 Replacing the Main PCB."
3. If not already done, re-install the Video PCB following the directions given in "5-2-3 Replacing the Video PCB."
4. Position the Rear Cover making sure the tabs along the front edge are properly snapped in place. Replace the four screws.
5. Set the monitor on its Base and make sure that the CRT faceplate was not scratched or otherwise damaged.

6 Alignments and Adjustments

This section of the service manual explains how to control the raster size, position, pincushion, and make convergence and color adjustments.

Caution: The degaussing coil must be connected at CN601 and CN602 on the main PCA before servicing or operation of the monitor. Failure to do so may burn out the Resistor at R602.

6-1 Adjustment Conditions

Direction

When servicing, always face the monitor toward the East and, whenever possible, use magnetic field isolation such as a helmholtz field around the monitor.

Caution: Other electrical equipment may cause external magnetic fields.

During servicing, use an external degaussing coil to limit magnetic build up. If an external degaussing coil is not available, use the internal degaussing circuit, but not more than once per minute.

After finishing all adjustments, test the monitor in all directions. If, for example, the monitor does not meet adjustment specifications when facing in a northerly direction, face the monitor eastward again and readjust the monitor to the smallest error possible within a reasonable time limit. Test the unit again in all directions. If the monitor again fails to meet specifications in a non-easterly direction, contact your region's main service center for possible CRT replacement.

Testing and Burn-in Mode

For testing and burn-in, remove the signal cable from the monitor. Power on the monitor and warm it up. Use the burn-in mode to age the monitor.

Power Supply Voltage

AC 90-264 Volt (60/50 Hz \pm 3 Hz).

High Voltage Control

Adjust VR407 to 24.5 kV \pm 0.5 kV.

Warm-Up Time

The display must be on for 30 minutes before starting alignment. Warm-up time is especially critical in color temperature and white balance adjustments.

Signal

Video analog 0.714 Vp-p positive at 75 ohm terminated.

Sync: Separate
(TTL level negative/positive).

Scanning Frequency

Horizontal/Vertical
31.47 kHz/70 Hz, 31.47 kHz/60 Hz,
35.52 kHz/87 Hz, 37.86 kHz/72.8 Hz,
35.16 kHz/56 Hz, 37.88 kHz/60.3 Hz,
37.50 kHz/75 Hz, 46.88kHz/75Hz,
48.36kHz/60.00Hz

6-2 Prepare Main PCB for Adjustment

+B 166V Line Adjustment

No beam, Contrast: Minimum,
Brightness: Minimum.

Adjust VR601 to DC 166 V \pm 1 V at T402 heat sink and GND.

High Voltage Adjustment

No beam, Contrast: Minimum,
Brightness: Minimum
Adjust VR407 to 24.5 kV \pm 0.5 kV.

Center Raster

Adjust VR403 (H-hold) for the horizontal frequency equal to 31.5 \pm 0.2 kHz.

6-3 Display Control Adjustments

Unless otherwise specified, adjust the EXT-VR:

Contrast : Max. (Fully clockwise)
Brightness : Max. (Fully clockwise)

6-3-1 Centering

Centering means to position the center point of the display in the middle of the display area.
Horizontal size and position and vertical size and position control the centering of the display.
Adjust the horizontal size and vertical size to their optimal settings: 255 mm (H) x 191 mm (V)
Adjust the horizontal position and vertical position to ≤4.0 mm of the center point of the screen.
 $|A - B| \leq 4.0 \text{ mm.}$
 $|C - D| \leq 4.0 \text{ mm.}$

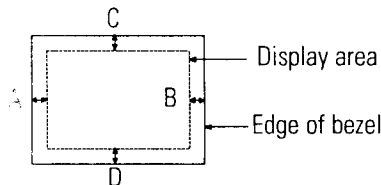


Figure 6-1. Centering

6-3-2 Horizontal Size Adjustment

Conditions
Scanning frequency: 48.3 kHz/60 Hz (1024 x 768)
Display image: Crosshatch pattern
Brightness: Maximum
Contrast: Maximum
Adjust VR404 (H-size) to 255 ± 5mm.

6-3-3 Vertical Size Adjustment

Conditions
Scanning frequency: 48.3 kHz/60 Hz (1024 x 768)
Display image: Crosshatch pattern
Brightness: Maximum
Contrast: Maximum
Adjust VR401 (V-size) to 191 ± 5mm.

6-3-4 Horizontal/Vertical Position Adjustment

Conditions
Scanning frequency: 48.3 kHz/60 Hz (1024 x 768)
Display image: Crosshatch pattern
Adjust VR405 (H-shift) and VR301 (V-shift) to center the screen position.

Note : VR405 (H-shift), VR301 (V-shift), VR404 (H-size), VR401 (V-size), VR402 (Side-pin) are external controls. They are located along the lower edge of the front bezel.

6-3-5 Side Pincushion Adjustment

Conditions
Scanning frequency: 48.3 kHz/60 Hz (1024 x 768)
Display image: Crosshatch pattern
Adjust VR402 (S-pin) to compensate for East/West distortion.

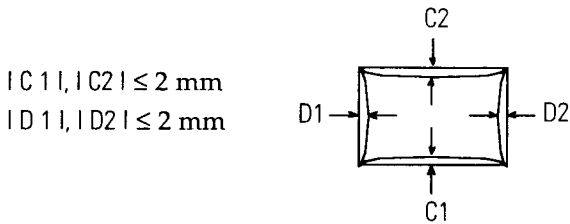


Figure 6-2. Pincushion

6-3-6 CRT Tilt Adjustment

Mechanical Adjustment:
Reassemble the CRT with fastening screws so that the measurements A and B are equal and the C and D measurements are equal.
If you are unable to correct the tilt, contact the regional service center for CRT replacement.

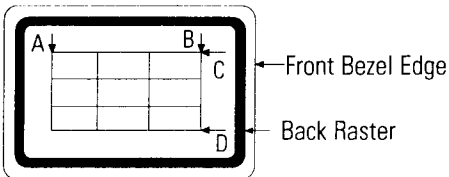


Figure 6-3. CRT Tilt Adjustment

6-4 Luminance Uniformity

Luminance uniformity means that the luminance at the position of the lowest brightness must be more than 70% of the luminance at the area with the highest brightness. Luminance is considered uniform only if the ratio of lowest to highest brightness is not less than 7:10.

Table 6-1. Computing Luminance Uniformity

Value	70 % (Min) $\text{Variation} = \frac{C}{A} \times 100$
Conditions	Display Image : White flat field. Luminance : Brightness cut off, Contrast max. A : Luminance at position of highest brightness. C : Luminance at position of lowest brightness.

6-5 White Balance Adjustment

Conditions

Measurement instrument: Color analyzer
Scanning frequency: 48.3 kHz/60 Hz
(1024 x 768)
Display image: 60 mm square
white pattern
Brightness: VR502, maximum

1. Adjust VR102R (R-BIAS) and VR102B (B-BIAS) so that the back raster color appears white to the unaided eye.
2. Set the brightness control (VR502) to the mechanical center position and the contrast control (VR501) to the maximum position.
3. Change the video signal to the 60mm square green pattern of the 48.3 kHz/60 Hz.
4. Adjust the VR101G (G-GAIN) so that the luminance of the green square is 40ft-L±2ft-L.
5. Change the video signal to the full white pattern of the 48.3 kHz/60 Hz.
6. Adjust the VR101R (R-GAIN) and VR101B (B-GAIN) to make the display color white.
(X=0.283 ± 0.02, Y=0.298 ± 0.02)
7. Adjust the contrast control (VR501) so that the luminance is 3ft-L.
8. Carefully adjust VR102R (R-BIAS) and VR102B (B-BIAS) for the display color to be white.
9. Check the color coordinates at 20ft-L luminance. If there is some error, adjust the VR101R
10. Turn the contrast and the brightness controls fully clockwise.
11. Adjust the focus control of the FBT to display the sharpest image possible. (R-GAIN) and VR101B (B-GAIN) display a white color.
12. Recheck the color coordinates at 3ft-L luminance and check the white color with rotating the contrast control (VR501). If there is some error, retry the adjustment from (2).
13. Recheck the back raster after disconnecting the signal cable.
Luminance tolerance 3.5ft-L ~ 15ft-L

6-6 Focus Adjustment

Conditions

Scanning frequency: 48.3 kHz/60 Hz
(1024 x 768)
Display image: "H" character pattern
Brightness: Maximum
Contrast: Maximum

1. Adjust the focus control of the FBT to display the sharpest image possible.
2. Use locktite to seal the focus control in position.

6-7 Color Purity Adjustment

Color purity is the absence of undesired color. Conspicuous mislanding (unexpected color in a uniform field) within the display area shall not be visible at a distance of 50 cm from CRT surface.

Note: Color purity adjustments should only be attempted by qualified personnel.

Conditions

Direction : Monitor facing east.
Display image : White flat field.
Luminance : Cutoff point at the center of display area.

6-8 Convergence Adjustments

Misconvergence occurs when one or more of the electron beams in a multi beam CRT fail to meet the other beams at a specified point.

Table 6-1. Misconvergence Tolerance

Position	Error in (mm)	CRT Dot Pitch	Model No.
Center (A)	0.3	0.28	CQB 4147 CQB 4157
	0.3	0.39	CQB 4143 CQB 4153
Corner (B)	0.4	0.28	CQB 4147 CQB 4157
	0.4	0.39	CQB 4143 CQB 4153

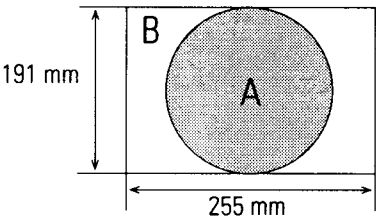
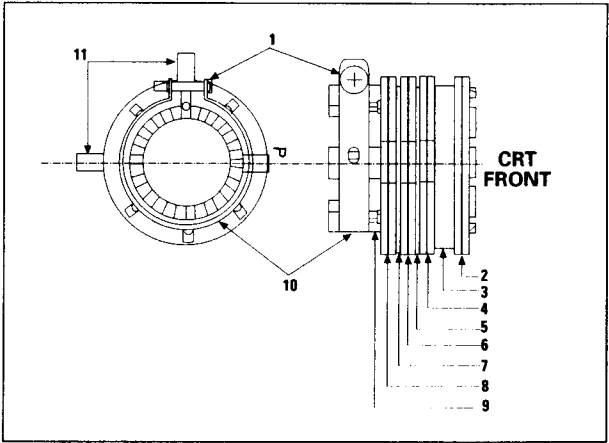


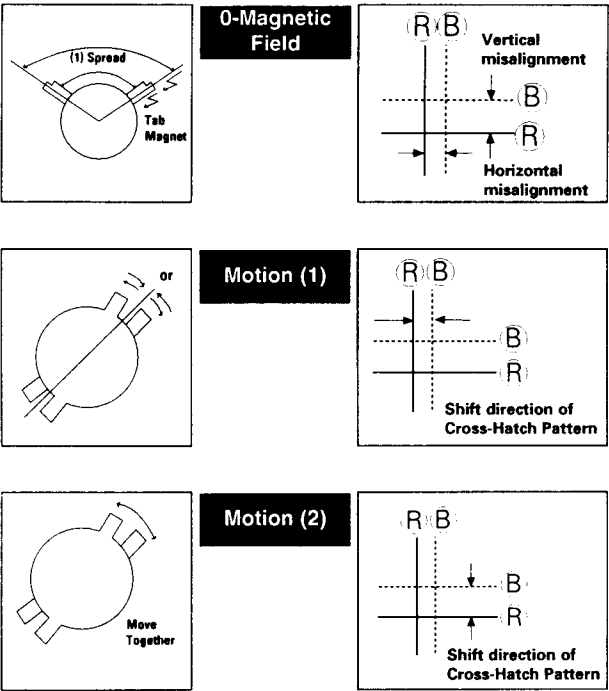
Figure 6-4. Convergence Measurement Areas



Samsung SDD CRT		
1: Setup Bolt	2: Bow Magnet	3: Band
4: 2-Pole Magnet	5: Spacer	6: 4-Pole Magnet
7: Spacer	8: 6-Pole Magnet	9: Holder
10: Band	11: Tabs	

Figure 6-5. Magnet Configuration

Red and Blue Alignment
(4-pole magnet movement)



Red and Blue and Green Alignment
(6-pole magnet movement)

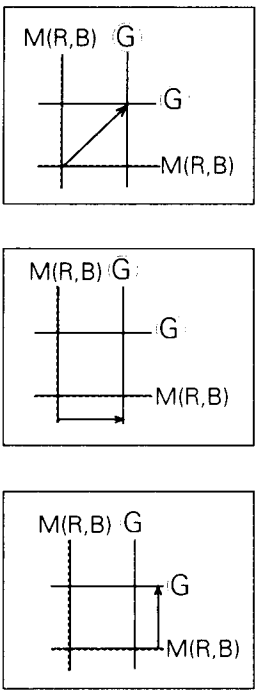


Figure 6-6. Magnet Movements

6-8-1 Static (Center) Convergence

Static convergence involves the alignment of the red, blue and green lines in the center area of the display.
See “Dynamic Convergence” for alignment of the color fields around the edges of the display.

Conditions

- Direction : Monitor facing east
- Warm-up : 30 minutes
- Display image : Crosshatch pattern
- Tolerances : See Table 6-1

As shown in Figure 6-5, CRTs used in these monitors all have the same magnet configuration as shown in table 6-2 below.

Table 6-2. Magnet Configurations

CRT Manufacturer	Magnet Order from Front of CRT
Samsung (SDD) CRTs	two-pole, four-pole six-pole

Use the following steps to correct any static misconvergence:

1. Locate the pair of four-pole magnet rings.
2. Unlock the rings and rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue lines.
3. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue lines.
4. After completing the red and blue center convergence adjustment, locate the pair of 6-pole magnet rings.
5. Rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue (magenta) and green lines.
6. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue (magenta) and green lines. Don't rotate the 2-pole magnet because it is for purity adjustments.
7. Mark the correct position for the magnets and apply a small line of glue to hold the magnets in place. Lock the rings in place.

6-8-2 Dynamic (Edge) Convergence

Use the following procedure to correct minor dynamic (edge) misconvergence. If, after using this procedure, dynamic misconvergence is still greater than the 0.4 mm tolerance around the periphery of the display area, replace the CRT.

1. Make sure the display is not affected by external magnetic fields.
2. Make sure the static convergence is properly adjusted.
3. Strategically place small magnetic strips on the back of the CRT to correct the misconvergence. Be careful not to remove the paper protecting the adhesive on the magnetic strip until you are satisfied with their placement and the dynamic convergence.
4. When you are satisfied with the convergence around the edge of the CRT, permanently glue the magnets to the back of the CRT.

Table 6-3. Magnetic Strips

Description	Size	Code Number
Magnet Sheet	5 mm x 80 mm	937 319004CA
Magnet Sheet	10 mm x 80 mm	937 319004AA

Warning



Do not remove the factory installed wedges. These wedges were installed by the CRT manufacturer and are properly placed for this CRT. Removal may result in damage to the CRT.

6-8-3 Bow Convergence Adjustment

Conditions

Direction: Monitor facing east.
Display Image: Crosshatch pattern mixed with RGB colors.

Bow convergence adjustments are not available for any of the CRTs used in the CQB** Series monitors. While all the CRTs have bow convergence magnets, they are sealed in the CRT factory and are not user or service technician adjustable. Do not touch these magnets (see Figure 6-5). If color convergence bow adjustment is out of alignment, replace the CRT.

Bow misconvergence should not exceed the values listed in Table 6-1: Misconvergence Tolerances.

6-8-4 Balance Convergence Adjustments

Balance Convergence involves the alignment of the red and blue lines when they are misaligned at one end more so than at the other (X). The deflection yoke holds the balance coils which can correct balance misconvergences.

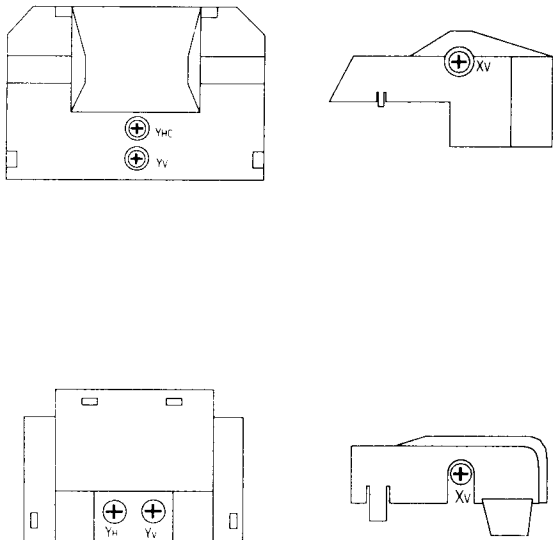


Figure 6-7. Deflection Yoke Caps

6-8-4 (a) Horizontal Line Red and Blue Balance Convergence

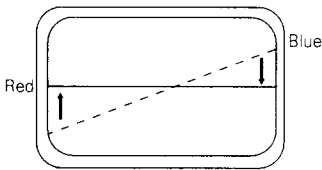


Figure 6-8. Horizontal Line Balance Misconvergence

Use a #0 hexdriver at the Horizontal Balance Coil (Xv). Turning the VR to the right raises the right end of the blue line and lowers the left end. Turning the VR to the left lowers the right end of the blue line and raises the left end.

6-8-4 (b) Vertical Red and Blue Balance Convergence

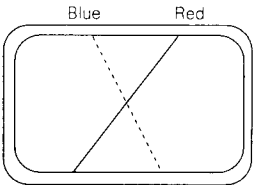


Figure 6-9. Vertical Line Balance Misconvergence

Use a #0 phillips screwdriver at the YH variable resistor. Turning the VR to the left tilts the blue line to the right. Turning it to the right tilts the blue line to the left.

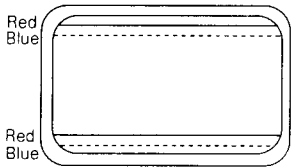
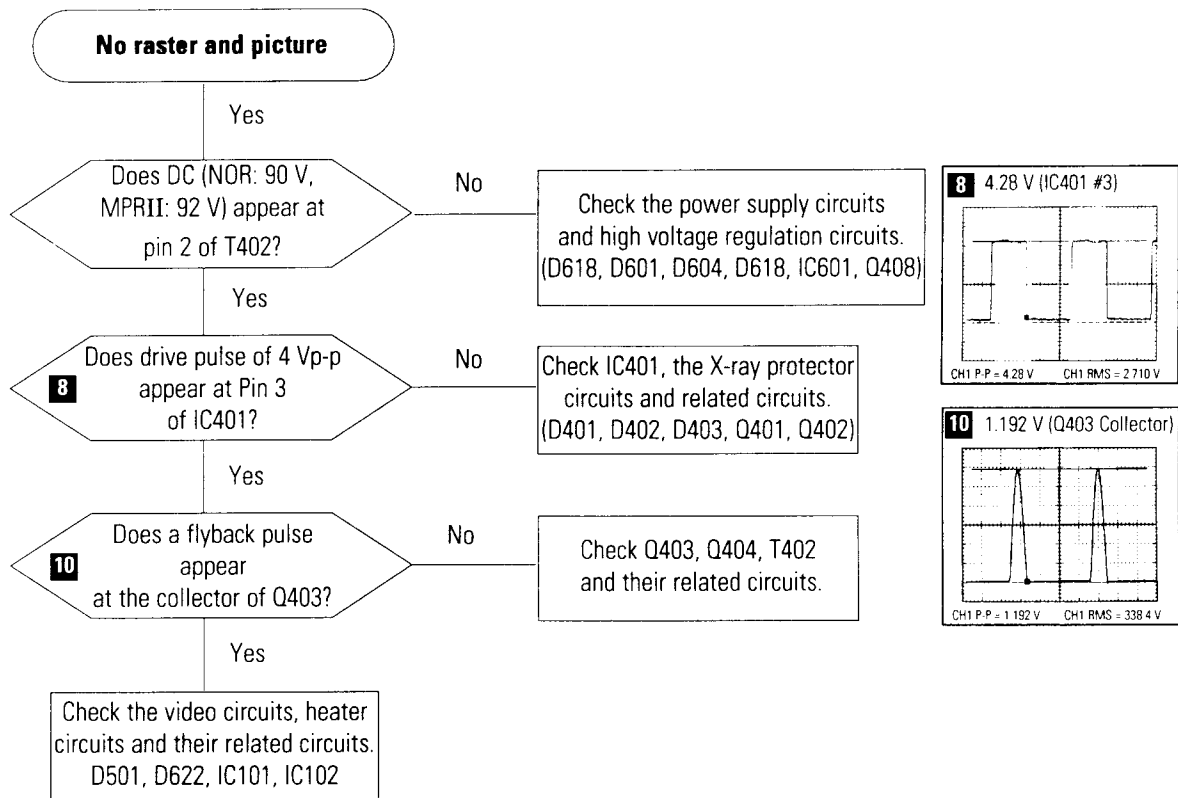


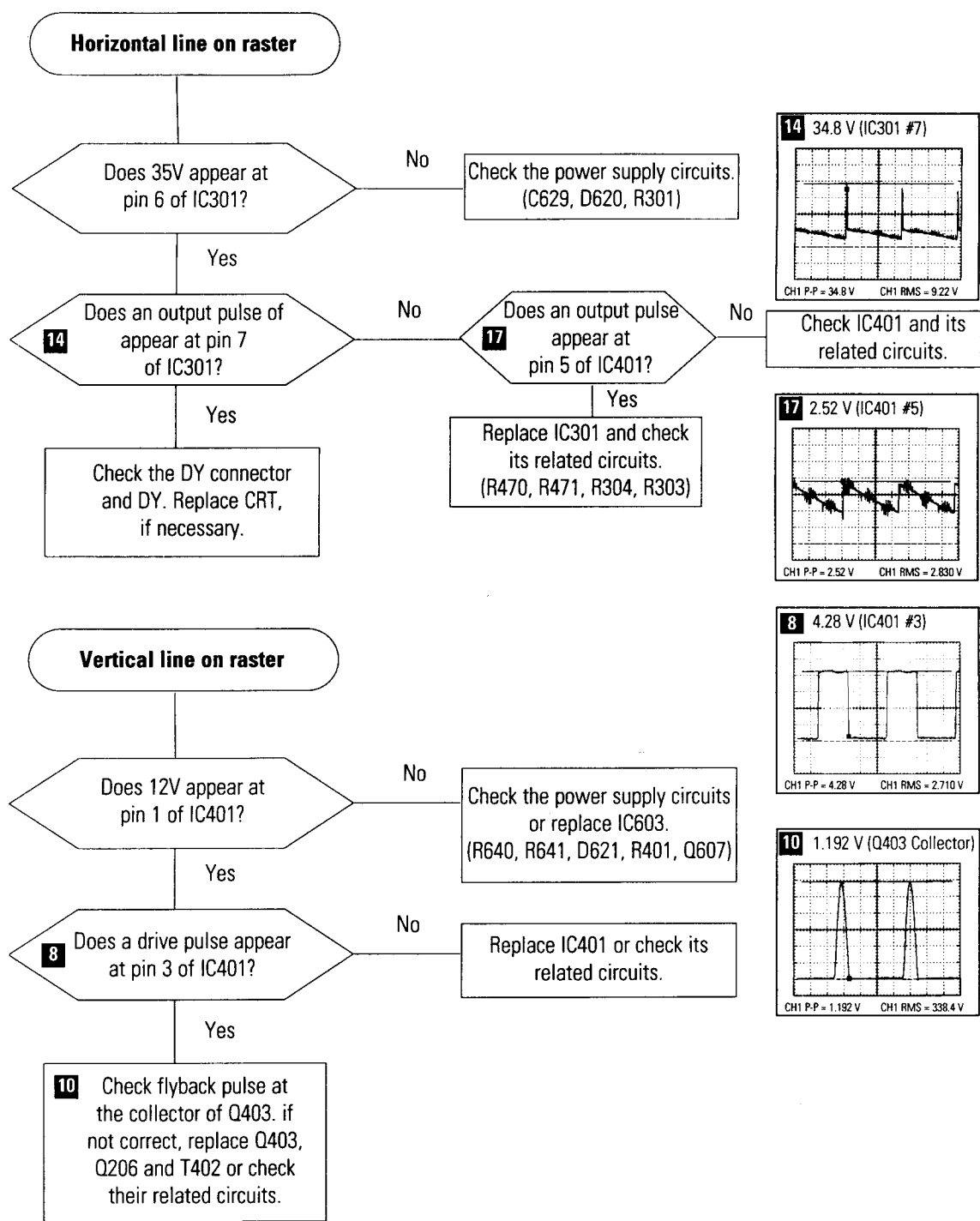
Figure 6-10. Upper and Lower Balance Misconvergence

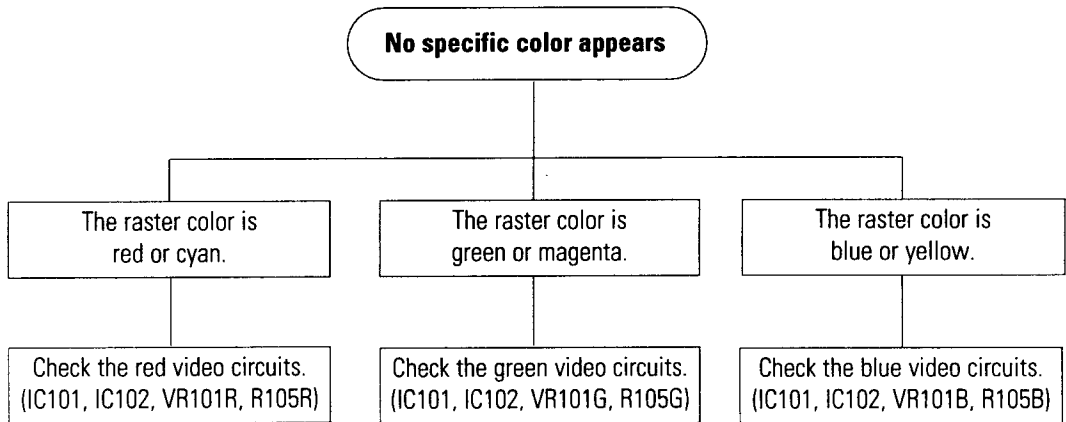
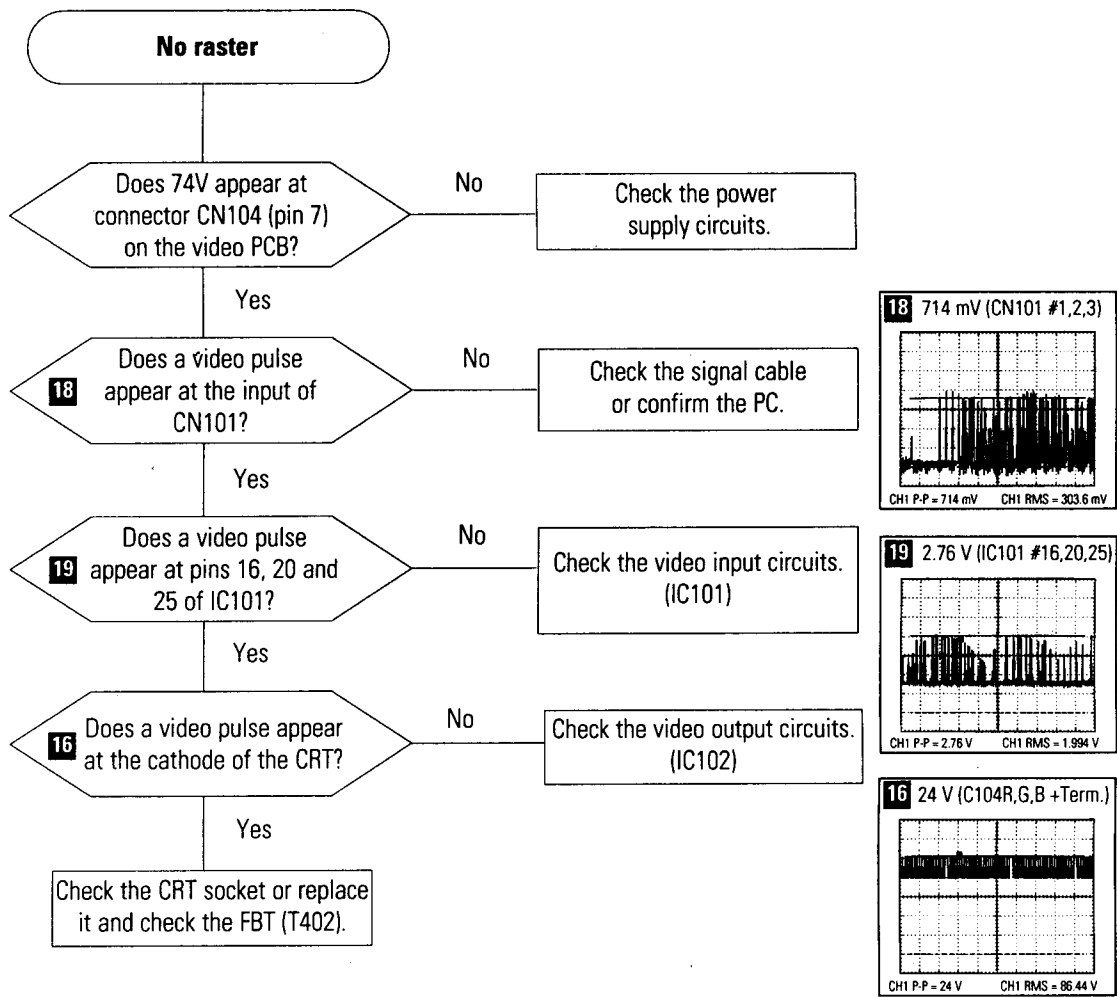
Use a #0 phillips screwdriver at the Yv variable resistor. Turning the VR to the left moves the blue line at the top upward and at the bottom, the line moves downward. Turning it to the right moves the blue line at the top downward and at the bottom, the line moves upward.

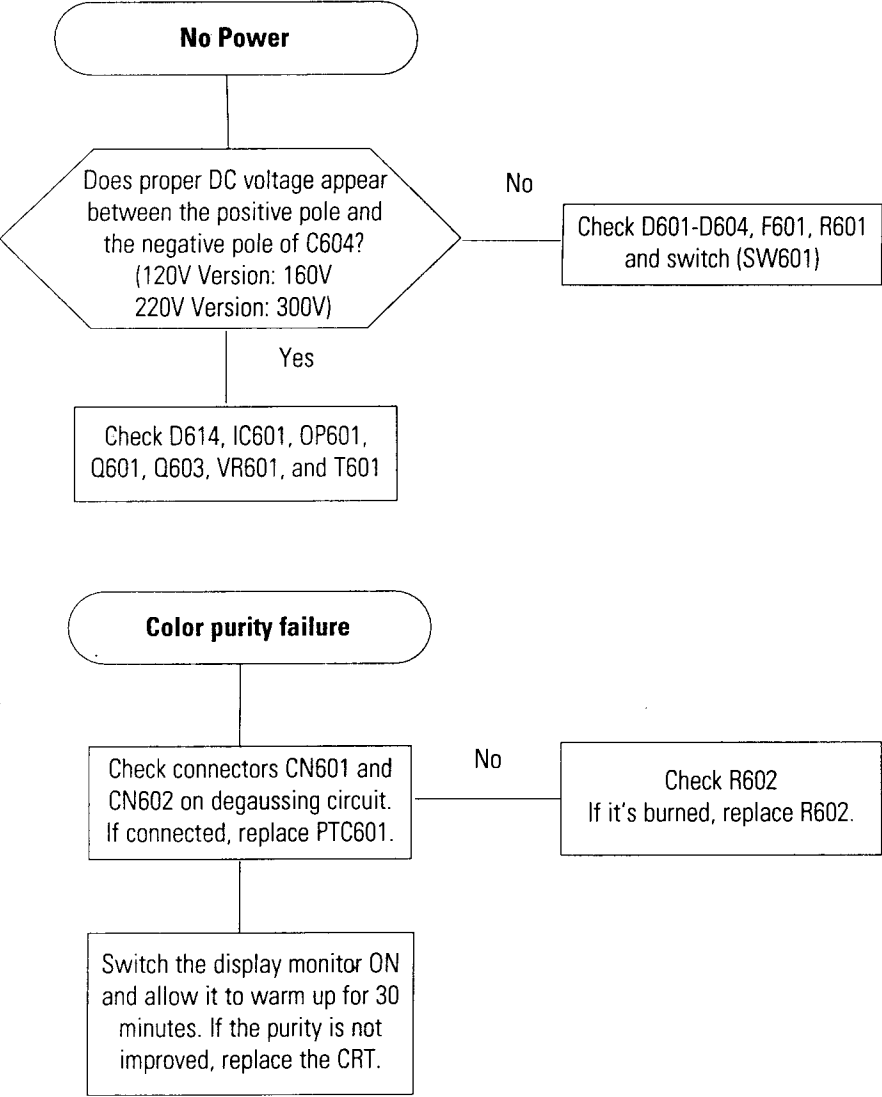
7 Troubleshooting

- Notes:**
- 1. If picture does not appear, fully rotate the brightness and contrast controls clockwise before inspection.
 - 2. Check the following circuits:
 - No raster appears: Power circuit, horizontal output circuit, H/V control circuit and H/V output circuit.
 - High voltage develops but no raster appears: Video output circuits.
 - High voltage does not develop: Horizontal output circuits.

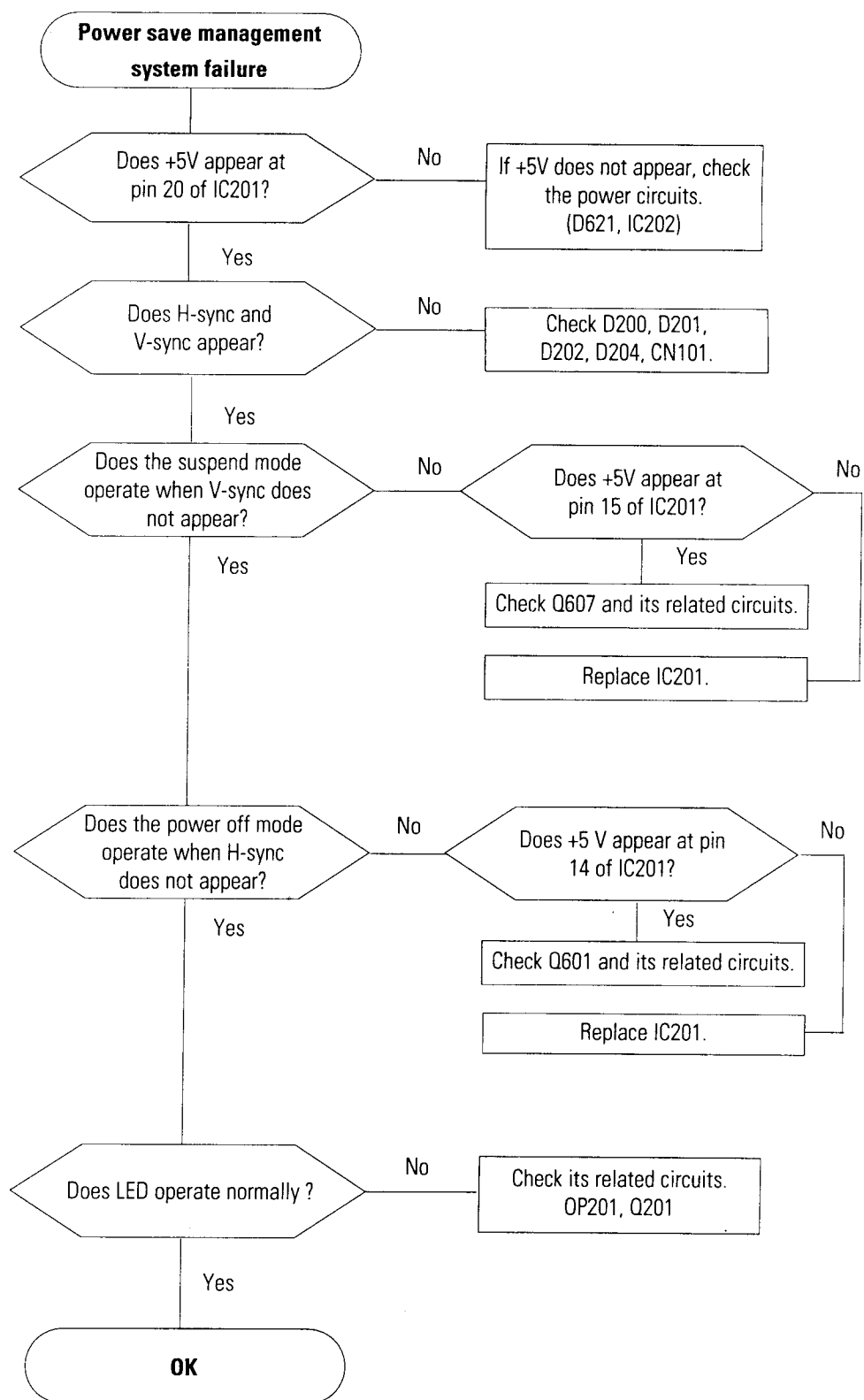


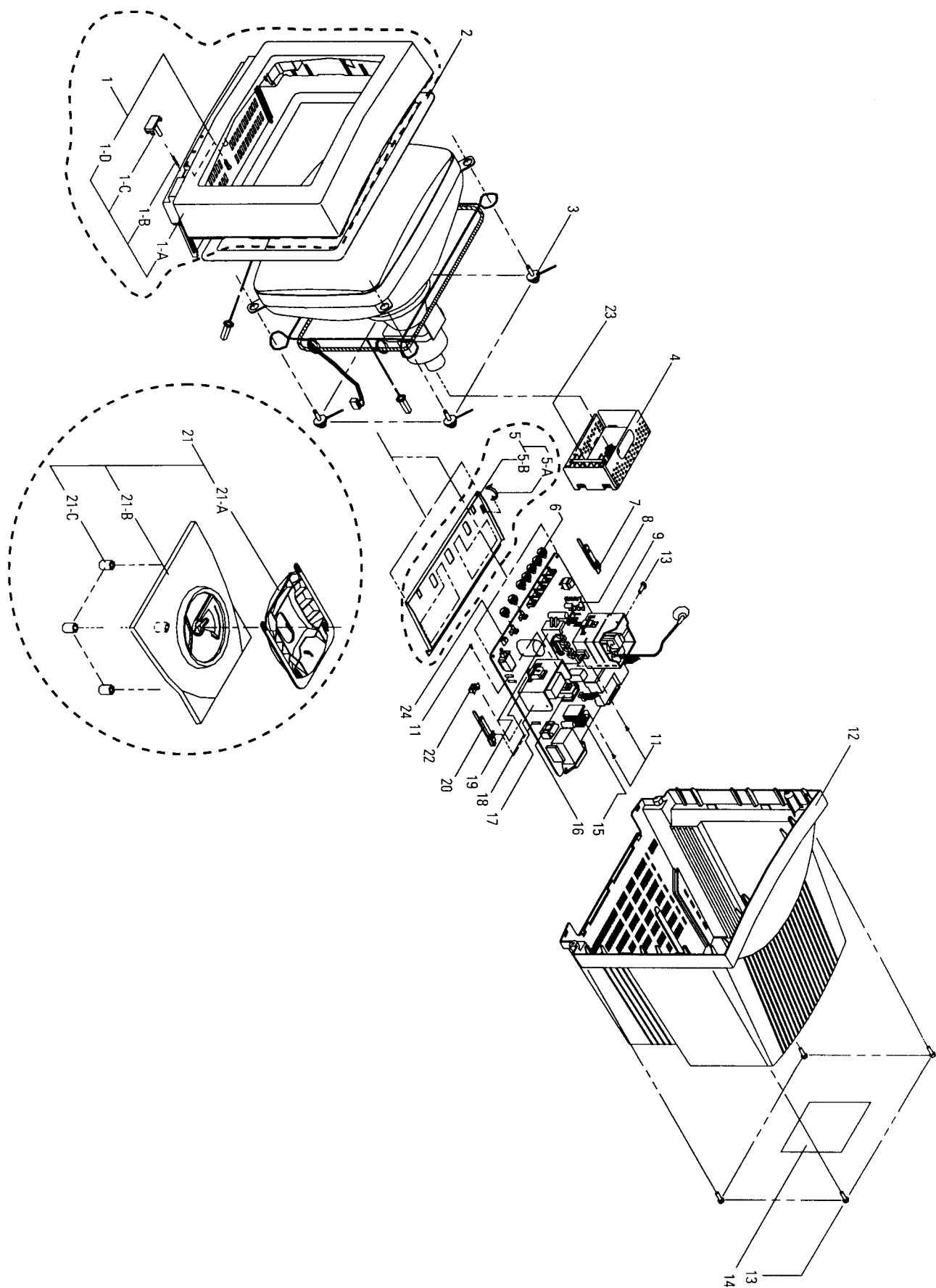






NOTE : If color purity is not normal, manually degauss the monitor using an external degaussing coil before inspection.



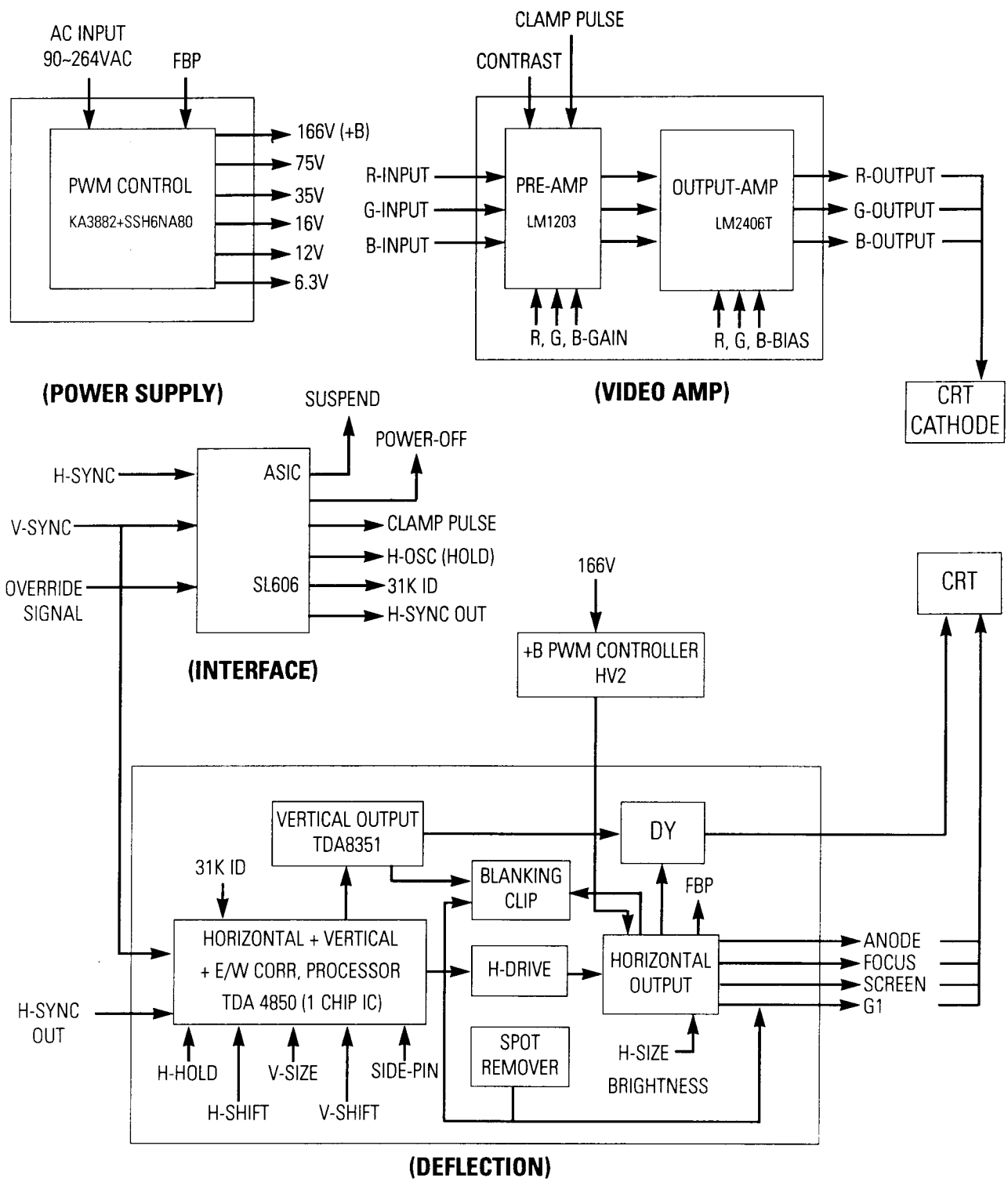


⚠ : Caution ● : Specialty part for this monitor only

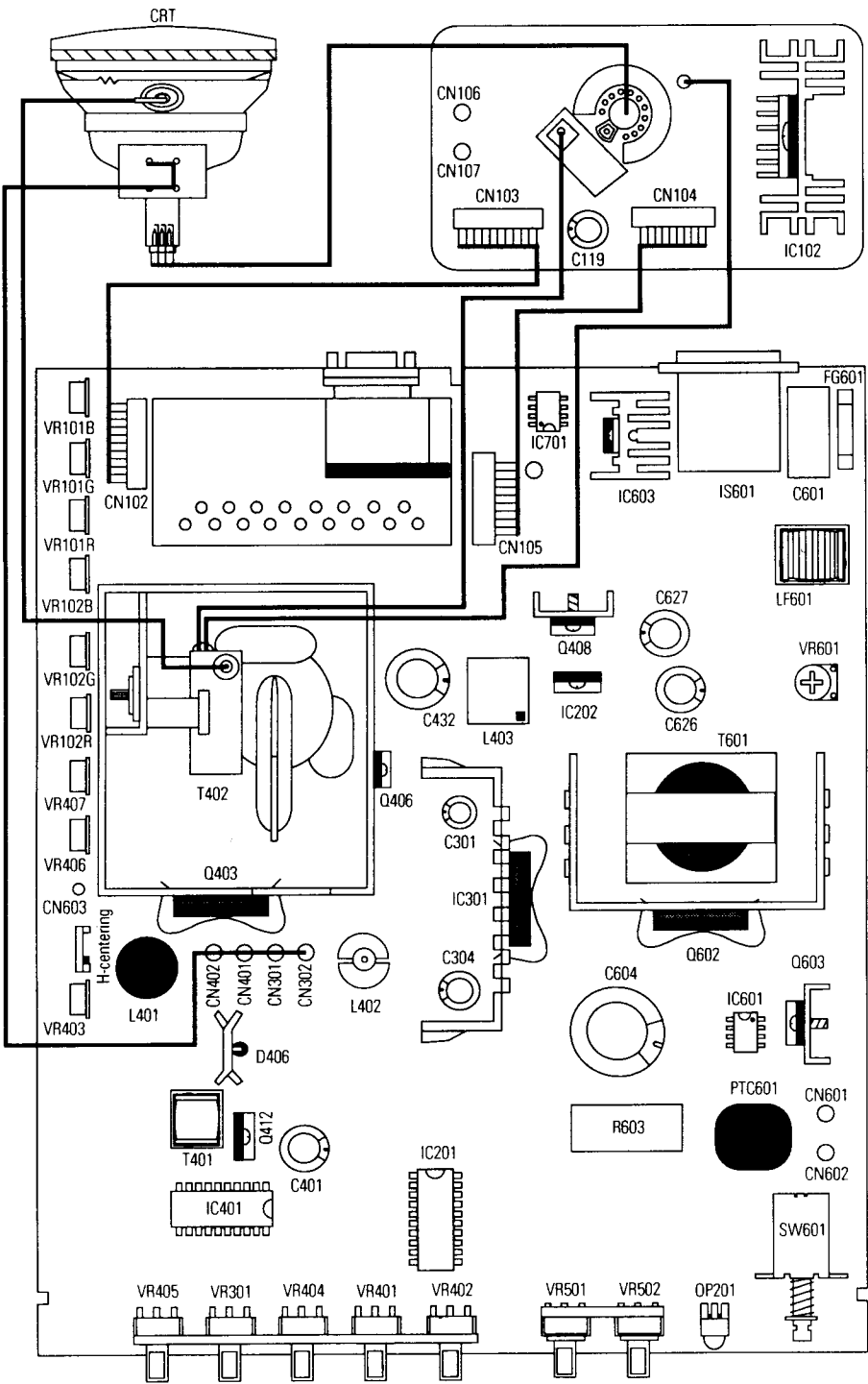
No.	Description	Code No.	Specification	Q'TY	Remark
1	COVER/FRONT-ASSY	BH75-10027C	CQA4147/CQB4147	1	●
	COVER/FRONT-ASSY	BH75-10027D	CQA4157/CQB4157	1	●
1-A	COVER-FRONT	BH72-60046A	ABS VO IV01, CQA4147/CQB4147	1	●
	COVER-FRONT	BH72-60054A	ABS VO IV01, CQA4157/CQB4157	1	●
1-B	SPRING-COIL	6107-000034	SUS-302 WPA, CQA4147/57, CQB4147/57	1	
1-C	KNOB-POWER	BH64-10024A	ABS VO IV01, CQA4147/CQB4147	1	●
	KNOB-POWER	BH64-10026A	ABS VO IV01, CQA4157/CQB4157	1	●
1-D	LENS-LED	BH67-10007A	ACRYL CLEAR, CQA4147/CQB4147	1	●
	LENS-LED	BH67-10008A	ACRYL CLEAR, CQA4157/CQB4157	1	●
2	SHIELD/F-ASSY	BH75-10070A	CQA4147/57, CQB4147/57	1	●
3	TAPPING,CRT	6006-000001	BH,+,1,M5,L30,ZPC3,W/W	4	
4	SHIELD-CRT,PCB	BH70-10009B	SPT E TO 3	1	●
5	B/CHASSIS-ASSY	BH75-10047B	CQA4147/57, CQB4147/57	1	●
5-A	BRKT-BOTTOM	BH70-10010A	SECC-1 TI 0	1	●
5-B	SPRING-PLATE	BH61-70002A	SUS-401 1/2H TO.2	1	●
6	KNOB-VR	BH64-10023A	ABS VO IV01	7	●
7	BRKT/G-PCB (L)	BH72-60052A	ABS VO IV01	1	●
8	H/SINK-DIODE	BH62-30009A	BS TI 0 TIN COATING	1	●
9	H/SINK-FBT	BH62-30017A	A1050S HI4 TI 0	1	
11	SCREW-TAPTITE	6003-000010	BH,+,1,M3,L10,ZPC3,W/W	4	
12	COVER-REAR	BH72-60047A	ABS VO IV01	1	●
13	SCREW-TAPTITE	6003-000009	B,BH,+,M4,L16,ZPC3,SWCH	5	
14	LABEL-RATING	BH68-30025A	POLYESTER TO 0173	1	●
15	H/SINK-IC (317)	6203-000001	A6063 EXTR H35	1	●
16	H/SINK-TR (408)	BH62-30014A	SPC-1 TI 0	1	
17	H/SINK-POWER	BH62-30014A	A1250S HI4 T2 0	1	●
18	SPRING-TR	BH61-70003A	SUS-304 1/2H 0.17/TO.5	3	
19	H/SINK-IC (4866)	BH62-30010A	A1050S HI4 T3.0	1	●
20	BRKT/G-PCB (R)	BH72-60053A	ABS VO IV01	1	●
21	STAND-ASSY	BH75-10031A	CQA4147/57, CQB4147/57	1	●
21-A	STAND-TOP	BH72-60048A	ABS VO IV01	1	●
21-B	STAND-BASE	BH72-60049A	ABS VO IV01	1	●
21-C	RUBBER-FOOT	BH61-40002A	NEOPRENE VO GRAY	4	
22	PCB-MOUNT	6103-000004	NYLON 66	2	
23	H/SINK-IC (102)	6203-000008	A6063 EXTR H35	1	
24	HOLDER-LED	BH67-3001A	ABS VO IV01	1	●

9 Servicing Diagrams

9-1 Block Diagram



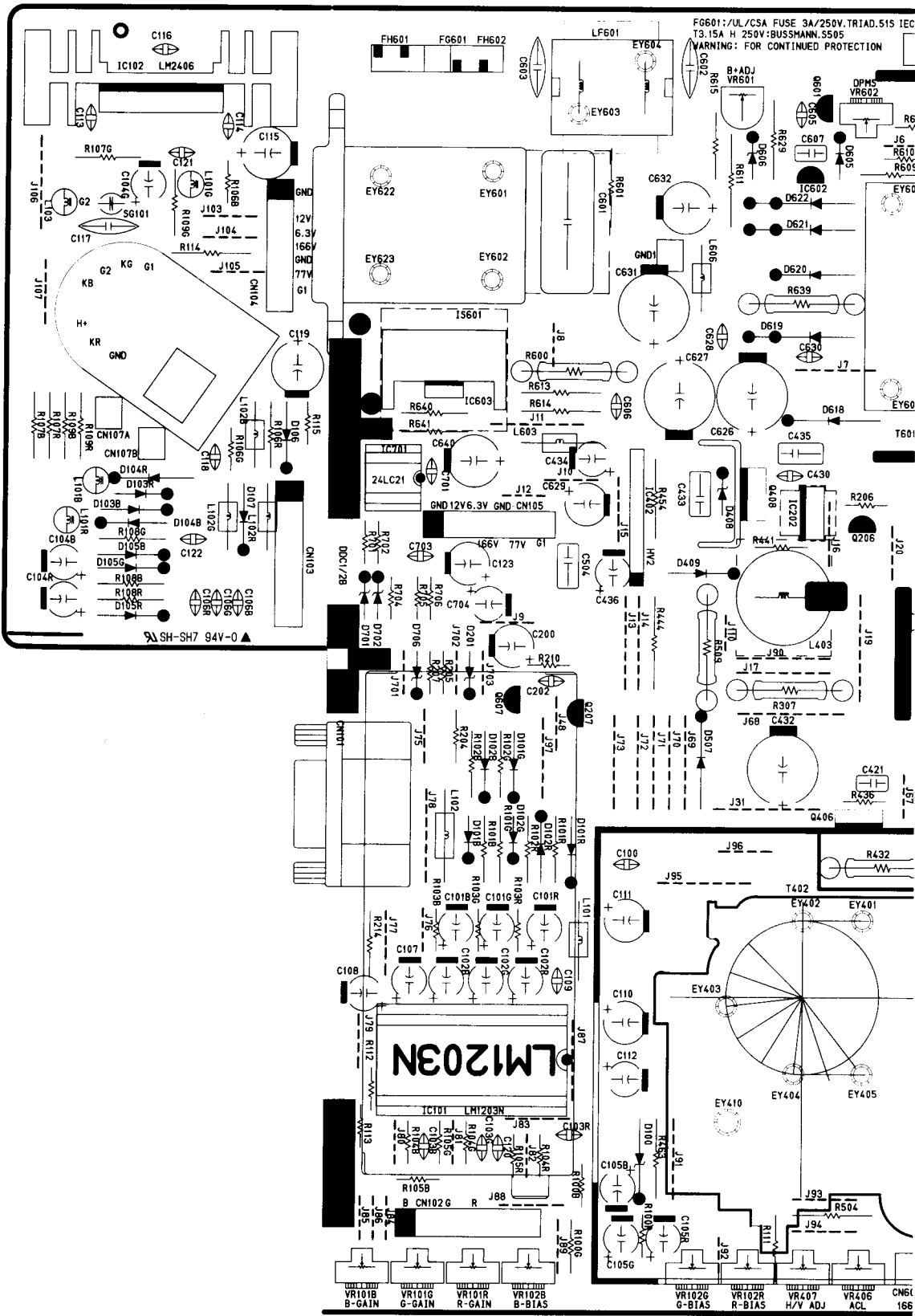
9-2 Wiring Diagram

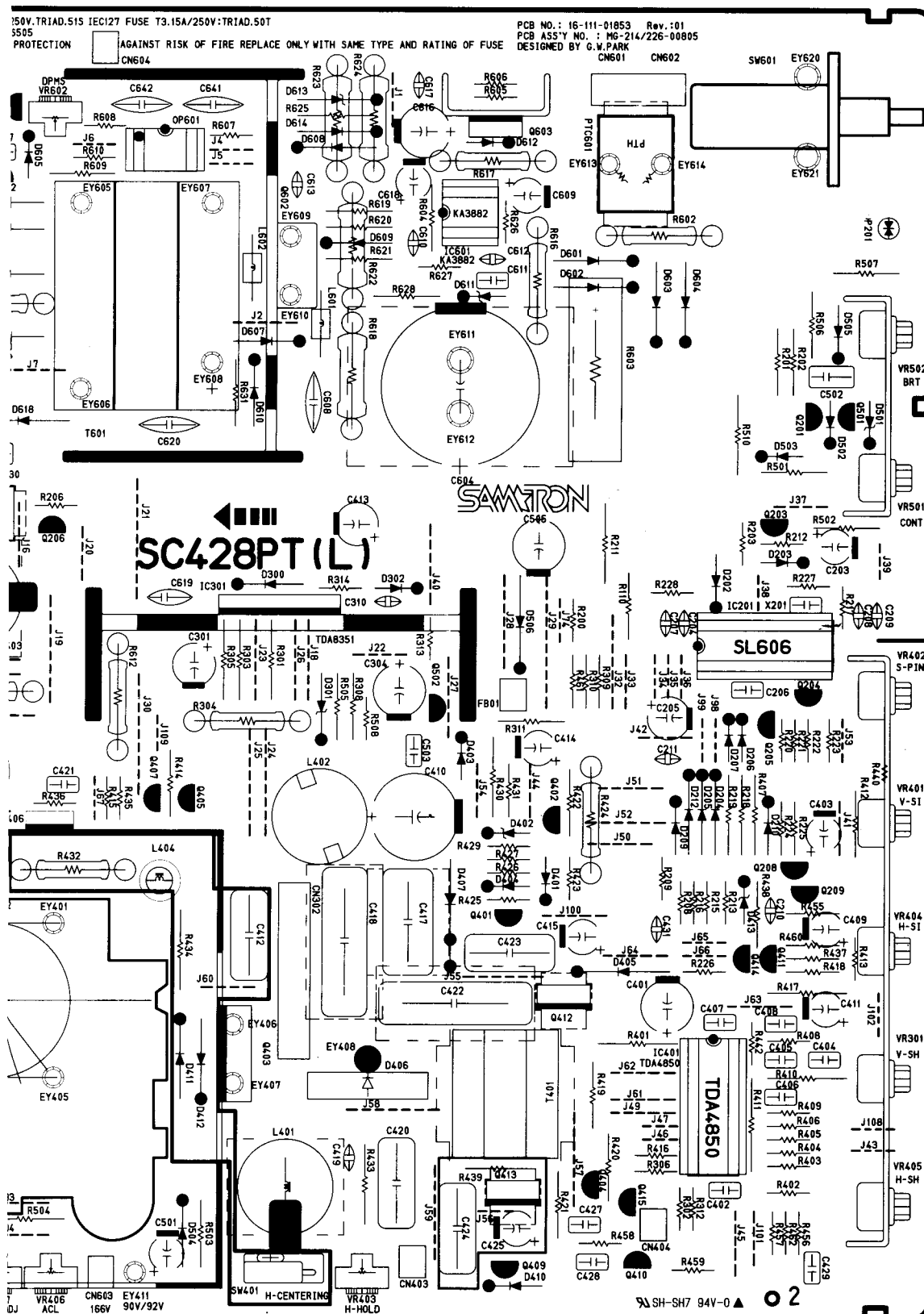


9-3 PCB Layout and Electrical Parts List

9-3-1 PCB Layout

Main and CRT Socket, Top View












9-3-2 Main & CRT Socket PCB Parts List (⚠ : Caution, ● : Specialty part for this monitor only, ⚡ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
CAPACITORS			
C100	C-CER,0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C101B	C-AL ELEC,10UF,20%,50V,-40/85°C,RT (S)	917 122100HM	
C101G	C-AL ELEC,10UF,20%,50V,-40/85°C,RT (S)	917 122100HM	
C101R	C-AL ELEC,10UF,20%,50V,-40/85°C,RT (S)	917 122100HM	
C102B	C-AL ELEC,4.7UF,20%, 50V,-40/85°C,RT,(S)	917 121470HM	
C102G	C-AL ELEC,4.7UF,20%, 50V,-40/85°C,RT,(S)	917 121470HM	
C102R	C-AL ELEC,4.7UF,20%, 50V,-40/85°C,RT,(S)	917 121470HM	
C103B	C-CER,33PF,5%,50V,-25/'85°C,RT	915 312330HJXH	
C103G	C-CER,33PF,5%,50V,-25/'85°C,RT	915 312330HJXH	
C103R	C-CER,33PF,5%,50V,-25/'85°C,RT	915 312330HJXH	
C104B	C-AL ELEC,1UF,20%,160V,-40/85°C,RT	917 122100NM	
C104G	C-AL ELEC,1UF,20%,160V,-40/85°C,RT	917 122100NM	
C104R	C-AL ELEC,1UF,20%,160V,-40/85°C,RT	917 122100NM	
C105B	C-AL ELEC,10UF,20%,50V,-40/85°C,RT (S)	917 122100HM	
C105G	C-AL ELEC,10UF,20%,50V,-40/85°C,RT (S)	917 122100HM	
C105R	C-AL ELEC,10UF,20%,50V,-40/85°C,RT (S)	917 122100HM	
C106B	C-CER,0.01UF,-20/80%,500V-25/85°C,RT	915 325100VZVH	
C106G	C-CER,0.01UF,-20/80%,500V-25/85°C,RT	915 325100VZVH	
C106R	C-CER,0.01UF,-20/80%,500V-25/85°C,RT	915 325100VZVH	
C107	C-AL ELEC,10UF,20%,50V,-40/85°C,RT (S)	917 122100HM	
C108	C-AL ELEC,100UF,20%,16V,-40/85°C,RT,SMALL	917 123100CM	
C109	C-CER0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C110	C-AL ELEC,100UF,20%,16V,-40/85°C,RT,SMALL	917 123100CM	
C111	C-AL ELEC,100UF,20%,16V,-40/85°C,RT,SMALL	917 123100CM	
C112	C-AL ELEC,100UF,20%,16V,-40/85°C,RT,SMALL	917 123100CM	
C113	C-CER,0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C114	C-CER,0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C115	C-AL ELEC,47UF,20%,100V,-40/85°C,RT	917 742470LM	
C116	C-CER,0.01UF,-20/80%,500V-25/85°C,RT	915 325100VZVH	
C117	C-CER,2700PF,10%,2KV	2201-000022	
C118	C-CER,0.01UF,-20/80%,500V-25/85°C,RT	915 325100VZVH	
C119	C-AL ELEC,3.3UF,20%,250V,-40%/'85°C,RT	917 121330QM	
C120	C-CER,0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C122	C-CER,0.01UF,-20/80%,500V-25/85°C,RT	915 325100VZVH	
C123	C-AL ELEC,100UF,20%,16V,-40/85°C,RT,SMALL	917 123100CM	
C200	C-AL ELEC,100UF,20%,16V,-40/85°C,RT,SMALL	917 123100CM	
C202	C-CER,0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C203	C-AL ELEC,10UF,20%,50V,-40/85°C,RT (S)	917 122100HM	
C204	C-CER,0.1UF,-20/80%,50V-25/85°C,RT"	915 336100HZVH	
C205	C-AL ELEC,100UF,20%,16V,-40/85°C,RT,SMALL	917 123100CM	
C206	C-POLYESTER,0.0022UF,10%,100V,-,RT	916 164220LJAH	
C207	C-CER,33PF,5%,50V,-25/'85°C,RT	915 312330HJXH	
C208	C-CER,47PF,5%,50V,-25/'85°C,RT	915 312470HJXH	
C209	C-CER,47PF,5%,50V,-25/'85°C,RT	915 312470HJXH	
C210	C-CER,0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C211	C-CER,0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C301	C-AL ELEC,100UF,20%,50V,-40/85°C,RT (S)	917 123100HM	
C304	C-AL ELEC,470UF,20%,25V,-40/85°C,RT	917 123470EM	
C305	C-POLYESTER,0.0068UF,10%,100V,-,RT	916 165680LJAH	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚡ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
C310	C-CER,33PF,5%,50V,-25/'85'C,RT	915 312330HJXH	
C401	C-AL.ELEC,1000UF,16V,20%-40/85'C,RT	917 124100CM	
C402	C-METAL POLYESTER,0.22UF,10%,100V,-,RT	2305-000004	⚠ ●
C403	C-AL.ELEC,1UF,20%,50V,-40/85'C,RT,MSALL	917 121100HM	
C404	C-POLYESTER,0.047UF,10%,100V,-,RT	916 165470LJAH	
C405	C-POLYESTER,0.001UF,10%,100V,CQ92MT	916 164100LJAH	
C406	C-POLYESTER,0.1UF,5%,100V,RT	916 166100LJAH	
C407	C-PP,3300PF,100V 2%	916 354330LJAL	
C408	C-POLYESTER,0.01UF,10%,100V,CQ92MT	916 165100LJAH	
C409	C-AL.ELEC,1UF,20%,50V,-40/85'C,RT,MSALL	917 121100HM	
C410	C-AL.ELEC,3.3UF,20%,50V,-40/'85'C,RT	917 121330HM	
C411	C-AL.ELEC,1UF,20%,50V,-40/85'C,RT,MSALL	917 121100HM	
C412	C-PP,393J,5%,250V	2303-000005	⚠ ●
C413	C-AL.ELEC,220UF,20%,25V,-40/85'C,RT	917 123220EM	
C414	C-AL.ELEC,10UF,20%,16V,-40/85'C,RT,SMALL	917 122100CM	
C415	C-AL.ELEC,10UF,20%,25V,-40/85'C,RT (S)	917 122100EM	
C417	C-PP,103J,5%,630V	916 355100WJAX	
C418	C-PP,252J,1.6KV,5%	916 944250YJAH	⚠
C418	MPR2—272J,1.6KV,5%	916 944270YJAH	⚠
C419	C-CER,560PF,10%,500V,-25/85'C,RT	915 323560VKPH	
C420	C-MPP,334J,5%,250V AC	916 656330QJAL	
C421	C-POLYESTER,0.0022UF,10%,100V,-,RT	916 164220LJAH	
C422	C-PP,282J,1.6KV,5%	2303-000006	⚠ ●
C423	C-PP,103J,5%,630V	916 355100WJAX	
C424	C-MPP,334J,5%,250V AC	916 656330QJAL	
C425	C-AL.ELEC,1UF,20%,50V,-40/85'C,RT,MSALL	917 121100HM	
C427	C-POLYESTER,0.0047UF,10%,100V,RT	916 164470LJAH	
C428	C-POLYESTER,0.01UF,10%,100V,CQ92MT	916 165100LJAH	
C429	C-POLYESTER,0.047UF,10%,100V,-,RT	916 165470LJAH	
C430	C-CER,560PF,10%,500V,-25/85'C,RT	915 323560VKPH	
C431	C-CER,1000PF,10%,50V,-25/85'C,RT	915 324100HKPH	
C432	C-AL.ELEC,47UF,20%,250V,-40/'85'C,RT	917 872470QM	
C433	C-METAL POLYESTER,0.1UF,250V,5%,RT	916 557100QKAL	
C434	C-AL.ELEC,100UF,20%,16V,-40/85'C,RT,SMALL	917 123100CM	
C435	C-METAL POLYESTER,0.1UF,250V,5%,RT	916 557100QKAL	
C436	C-AL.ELEC,100UF,20%,16V,-40/85'C,RT,SMALL	917 123100CM	
C501	C-AL.ELEC,1UF,20%,50V,-40/85'C,RT,MSALL	917 121100HM	
C502	C-METAL POLYESTER,0.1UF,250V,5%,RT	916 557100QKAL	
C503	C-POLYESTER,0.022UF,10%,100V,-,RT	916 165220LJAH	
C504	C-METAL POLYESTER,0.1UF,250V,5%,RT	916 557100QKAL	
C505	C-AL.ELEC,10UF,20%,250V,-25/85'C,RT	917 122100QM	
C601	C-MPP,474K,10%,250V AC	2305-000005	⚠ ●
C602	C-CER,2200PF,400V AC	915 344220MMVH	⚠
C603	C-CER,2200PF,400V AC	915 344220MMVH	⚠
C604	C-AL-ELEC,220UF,20%,400V,-25/105'C,PT	917 793220TMFX	⚠
C605	C-CER,0.1UF,-20/80%.50V,25/85'C,RT	915 336100HZVH	
C606	C-CER,2200PF,10%,500V,-25/85'C,RT	915 324220VKPH	
C607	C-POLYESTER,0.001UF,10%,100V,CQ92MT	916 164100LJAH	
C608	C-CER,103K,10%,1KV,-25/85'C,RB	915 325100XKPX	
C609	C-AL.ELEC,10UF,20%,50V,-40/85'C,RT (S)	917 122100HM	

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Loc. No.	Description	Code No.	Remarks
C610	C-CER,1000PF,10%,50V,-25/85°C,RT	915 324100HKPH	
C611	C-PP,3300PF,100V 2%	916 354330LJAL	
C612	C-CER,1000PF,10%,50V,-25/85°C,RT	915 324100HKPH	
C613	C-CER,560PF,10%,1KV,-25/85°C,RT	915 323560XKPH	
C616	C-AL.ELEC,47UF,20%,100V,-40/85°C,RT	917 742470LM	
C617	C-CER,0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C618	C-AL.ELEC,47UF,20%,25V,-40/85°C,RT(S)	917 122470EM	
C619	C-CER,4700PF 400V AC	915 344470MMVH	
C620	C-CER,4700PF 400V AC	915 344470MMVH	
C626	C-AL.ELEC,100UF,20%,100V,-40/85°C,RT	917 123100LM	
C627	C-AL.ELEC,220UF,100V,20%,-40%/85°C,RT	917 123220LM	
C628	C-CER,220PF 1KV 10%	915 323220XKPH	
C629	C-AL.ELEC,100UF,20%,50V,-40/85°C,RT (S)	917 123100HM	
C630	C-CER,0.01UF,-20/80%,500V-25/85°C,RT	915 325100VZVH	
C631	C-AL.ELEC,1000UF,20%,25V,-40/85°C,RT	917 124100EM	
C632	C-AL.ELEC,1000UF,16V,20%-40/85°C,RT	917 124100CM	
C640	C-AL.ELEC,220UF,20%,16V,-40/85°C,RT	917 123220CM	
C641	C-CER,4700PF 400V AC	915 344470MMVH	
C642	C-CER,4700PF 400V AC	915 344470MMVH	
C701	C-CER,470PF,10%,50V,-25/85°C,RT	915 323470HKPH	
C703	C-CER,0.1UF,-20/80%,50V,25/85°C,RT	915 336100HZVH	
C704	C-AL.ELEC,10UF,20%,16V,-40/85°C,RT,SMALL	917 122100CM	
CONNECTORS			
CN101	CONNECTOR D-SUBMINIATURE,2.286	935 100115AB	
CN102	CONN-10P,210MM,10P	BH39-40010A	
CN103	CONN-10P,210MM,10P	BH39-40010A	
CN104	CONN-9P,210MM,9P	BH39-40009A	
CN105	CONN-9P,210MM,9P	BH39-40009A	
CN106	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN107	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN108	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN301	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN302	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN401	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN402	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN403	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN404	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN601	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN602	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
CN603	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
FB01	BEAD PIN,D2.36x14.1 BRASS.SN	31-131-00012	
DIODES			
D100	ZENER DIODE,UZ12V	893 290031BB	
D101B	SWITCHING DIODE,1N4148	893 114148AANM	
D101G	SWITCHING DIODE,1N4148	893 114148AANM	
D101R	SWITCHING DIODE,1N4148	893 114148AANM	
D102B	SWITCHING DIODE,1N4148	893 114148AANM	
D102G	SWITCHING DIODE,1N4148	893 114148AANM	

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Loc. No.	Description	Code No.	Remarks
D102R	SWITCHING DIODE,1N4148	893 114148AANM	
D103B	SWITCHING DIODE,1N4148	893 114148AANM	
D103G	SWITCHING DIODE,1N4148	893 114148AANM	
D103R	SWITCHING DIODE,1N4148	893 114148AANM	
D104B	SWITCHING DIODE,1N4148	893 114148AANM	
D104G	SWITCHING DIODE,1N4148	893 114148AANM	
D104R	SWITCHING DIODE,1N4148	893 114148AANM	
D105B	SWITCHING DIODE,1N4148	893 114148AANM	
D105G	SWITCHING DIODE,1N4148	893 114148AANM	
D105R	SWITCHING DIODE,1N4148	893 114148AANM	
D106	DIODE,1N4007 GP	893 314007BA	
D107	DIODE,1N4007 GP	893 314007BA	
D201	ZENER DIODE,UZ5.1B	893 290031FB	
D202	SWITCHING DIODE,1N4148	893 114148AANM	
D203	SWITCHING DIODE,1N4148	893 114148AANM	
D204	SWITCHING DIODE,1N4148	893 114148AANM	
D205	SWITCHING DIODE,1N4148	893 114148AANM	
D206	SWITCHING DIODE,1N4148	893 114148AANM	
D207	SWITCHING DIODE,1N4148	893 114148AANM	
D209	SWITCHING DIODE,1N4148	893 114148AANM	
D210	SWITCHING DIODE,1N4148	893 114148AANM	
D212	SWITCHING DIODE,1N4148	893 114148AANM	
D300	RECTIFIER DIODE FR,1N4937 GP	893 314937AC	
D301	ZENER DIODE,UZ12V	893 290031BB	
D302	SWITCHING DIODE,1N4148	893 114148AANM	
D401	SWITCHING DIODE,1N4148	893 114148AANM	
D402	ZENER DIODE,UZ8.2B	893 290031AA	●
D403	RECTIFIER DIODE FR,1SS244	0401-000004	
D404	SWITCHING DIODE,1N4148	893 114148AANM	
D405	RECTIFIER DIODE FR,1N4937 GP	893 314937AC	
D406	RU4DS	893 390045AA	⚠
D407	RECTIFIER DIODE FR,UF5404	893 399044AA	⚠
D408	ZENER DIODE,UZ9.1B	893 290035AF	
D409	RECTIFIER DIODE FR,RGP15J 600V 1.5A 250NS	893 390015AB	
D410	SWITCHING DIODE,1N4148	893 114148AANM	
D411	RECTIFIER DIODE FR,RGP15J 600V 1.5A 250NS	893 390015AB	
D412	RECTIFIER DIODE FR,RGP15J 600V 1.5A 250NS	893 390015AB	
D413	ZENER DIODE,UZ5.1B	893 290031FB	
D501	ZENER DIODE,UZ6.2B	893 290031SB	
D502	SWITCHING DIODE,1N4148	893 114148AANM	
D503	RECTIFIER DIODE FR,1SS244	0401-000004	●
D504	SWITCHING DIODE,1N4148	893 114148AANM	
D505	RECTIFIER DIODE FR,1SS244	0401-000004	●
D506	RECTIFIER DIODE FR,1N4937 GP	893 314937AC	
D507	RECTIFIER DIODE FR,1N4937 GP	893 314937AC	
D601	RECTIFIER DIODE FR,1N5399GP	893 315399AA	⚠
D602	RECTIFIER DIODE FR,1N5399GP	893 315399AA	⚠
D603	RECTIFIER DIODE FR,1N5399GP	893 315399AA	⚠
D604	RECTIFIER DIODE FR,1N5399GP	893 315399AA	⚠
D605	SWITCHING DIODE,1N4148	893 114148AANM	

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Loc. No.	Description	Code No.	Remarks
D606	ZENER DIODE,UZ12V	893 290031BB	
D607	RECTIFIER DIODE FR,RGP02-12E	02169-206-297	
D608	RECTIFIER DIODE FR,RGP02-12E	02169-206-297	
D609	ZENER DIODE,UZ16B	893 290031HB	
D610	DIODE,1N4007	893 314007BA	
D611	ZENER DIODE,UZ5.1B	893 290031FB	
D612	SWITCHING DIODE,1N4148	893 114148AANM	
D613	ZENER DIODE,UZ16B	893 290031HB	
D614	DIODE,UF4007	893 394007AA	
D618	RECTIFIER DIODE FR,1R5NU41	893 399032AA	⚠
D619	RECTIFIER DIODE FR,UF5408	893 395408AA	⚠
D620	RECTIFIER DIODE FR,RGP15G/F1504	893 390015AD	
D621	RECTIFIER DIODE FR,UF5404	893 399044AA	⚠
D622	RECTIFIER DIODE FR,UF5404	893 399044AA	⚠
D701	ZENER DIODE,UZ5.1B	893 290031FB	
D702	ZENER DIODE,UZ5.1B	893 290031FB	
D706	ZENER DIODE,UZ5.1B	893 290031FB	
ICS			
IC101	IC,LINEAR,DIP,1203,RRGB VIDEO AMP,28	881 101203AA	⚡
IC102	LM2406T	1204-000010	⚡
IC201	IC-CUSTOM,SL606 ASIC DIP-20	BH13-10003A	⚡
IC202	IC .REGULATOR,TO-39,78M05	881 307805KANE	
IC301	TDA8351	1204-000021	⚡
IC401	IC,LINEAR,DIP-20,TDA4850	1204-000011	
IC402	IC-HYBRID,HV2	BH13-10002A	
IC601	IC,LINEAR,DIP-8,KA3882	881 903882AA	⚠
IC602	IC,REGULATOR,TO-92,KA431AZTA	881 300431TANB	
IC603	KA317	881 300317KANC	
IC701	IC-EEPROM DIP-8,24LC21	883 602421AA	⚡
OP601	IC OPTO/COUPLER DIF-6,CQY80-XG	895 520080AB	
COILS			
L101	FITER,CORE,1.5mH(L)	02429-048-017	
L101B	COIL- PEAKING,0.82UH+/-25%	2702-000002	●
L101G	COIL- PEAKING,0.82UH+/-25%	2702-000002	●
L101R	COIL- PEAKING,0.82UH+/-25%	2702-000002	●
L102R	FITER,CORE,2.4UH,5.5MM,BEAD,0.032 OHM(S)	937 120211AA	
L102G	FITER,CORE,2.4UH,5.5MM,BEAD,0.032 OHM(S)	937 120211AA	
L102B	FITER,CORE,2.4UH,5.5MM,BEAD,0.032 OHM(S)	937 120211AA	
L102	FITER,CORE,2.4UH,5.5MM,BEAD,0.032 OHM(S)	937 120211AA	
L103	FITER,CORE,COIL INDUCTOR 100UH RT	2702-000001	●
L601	FITER,CORE,2.4UH,5.5MM,BEAD,0.032 OHM(S)	937 120211AA	
L602	FITER,CORE,2.4UH,5.5MM,BEAD,0.032 OHM(S)	937 120211AA	
L603	FITER,CORE,1.5mH(L)	02429-048-017	
L606	FITER,CORE,2.4UH,5.5MM,BEAD,0.032 OHM(S)	937 120211AA	
L401	COIL,H-LIN,FIX,12UH,30% COPPER-WIRE,NS	BH27-20019A	⚠ ●
L402	COIL,CHOKE,200UH,10%	BH27-20004A	
L403	COIL-CHOCK,3.2MH ,15%	925 460181SA	
L404	COIL-PEAKING,8.2MH ,10%	925 460125DC	
LF601	FILTER,LINE,15MH MIN	BH27-20012A	

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Loc. No.	Description	Code No.	Remarks
TRANSISTORS			
Q201	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q203	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q204	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q205	FET-N,VN2222LL	891 892222AA	
Q206	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q207	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q208	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q209	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q401	TR PNP TO-92,KSC733CY /KTA1266Y /1015Y	0501-000006	●
Q402	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q403	2SC5149	891 465149AA	
Q404	TR NPN TO-92,KSC1008Y	891 391008XA	
Q405	TR PNP TO-92,KSC733CY /KTA1266Y /1015Y	0501-000006	●
Q406	MJE800	0503-000001	●
Q407	TR PNP TO-92,KSC733CY /KTA1266Y /1015Y	0501-000006	●
Q408	IRF9610	891 799610AA	
Q409	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q410	TR PNP TO-92,KSC733CY /KTA1266Y /1015Y	0501-000006	●
Q411	TR PNP TO-92,KSC733CY /KTA1266Y /1015Y	0501-000006	●
Q412	FET N-CHANNEL,2SK1351,5A,500V	0505-000009	●
Q413	FET N-CHANNEL,IRF630,9A,200V,0.4 OHM,PW,TO-220	891 890630AA	
Q414	TR PNP TO-92,KSC733CY /KTA1266Y /1015Y	0501-000006	●
Q415	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q501	TR PNP TO-92,KSC733CY /KTA1266Y /1015Y	0501-000006	●
Q502	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q601	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
Q602	SSH6N80	891 890680AA	
Q603	KSC3503	891 493503AA	
Q607	TR NPN TO-92,KSC945CY /KTC3198Y /1815Y	0501-000005	●
RESISTORS			
R100B	R-CARBON,22K OHM,1/6W,5%	911 152207YA	
R100G	R-CARBON,22K OHM,1/6W,5%	911 152207YA	
R100R	R-CARBON,22K OHM,1/6W,5%	911 152207YA	
R101B	R-CARBON,47 OHM,1/6W,5%	911 124707YA	
R101G	R-CARBON,47 OHM,1/6W,5%	911 124707YA	
R101R	R-CARBON,47 OHM,1/6W,5%	911 124707YA	
R102B	R-CARBON,75 OHM,1/6W,5%	911 127507YA	
R102G	R-CARBON,75 OHM,1/6W,5%	911 127507YA	
R102R	R-CARBON,75 OHM,1/6W,5%	911 127507YA	
R103B	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R103G	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R103R	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R104B	R-CARBON,200 OHM,1/6W,5%	911 132007YA	
R104G	R-CARBON,200 OHM,1/6W,5%	911 132007YA	
R104R	R-CARBON,200 OHM,1/6W,5%	911 132007YA	
R105B	R-CARBON,390 OHM,1/6W,5%	911 133907YA	
R105G	R-CARBON,390 OHM,1/6W,5%	911 133907YA	
R105R	R-CARBON,390 OHM,1/6W,5%	911 133907YA	

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Loc. No.	Description	Code No.	Remarks
R106B	R-CARBON,47 OHM,1/6W,5%	911 124707YA	
R106G	R-CARBON,47 OHM,1/6W,5%	911 124707YA	
R106R	R-CARBON,47 OHM,1/6W,5%	911 124707YA	
R107B	R-CARBON,150 OHM,1/4W,5%	911 131507DA	
R107G	R-CARBON,150 OHM,1/4W,5%	911 131507DA	
R107R	R-CARBON,150 OHM,1/4W,5%	911 131507DA	
R108B	R-CARBON,470K OHM,1/4W,5%	911 164707DA	
R108G	R-CARBON,470K OHM,1/4W,5%	911 164707DA	
R108R	R-CARBON,470K OHM,1/4W,5%	911 164707DA	
R109B	R-CARBON,100 OHM,1/4W,5%	911 131007DA	
R109G	R-CARBON,100 OHM,1/4W,5%	911 131007DA	
R109R	R-CARBON,100 OHM,1/4W,5%	911 131007DA	
R110	R-CARBON,1K OHM,1/6W,5%	911 141007YA	
R111	R-CARBON,5.6K OHM,1/4W,5%	911 145607DA	
R112	R-CARBON,82K OHM,1/6W,5%	911 158207YA	●
R113	R-CARBON,11K OHM,1/6W,5%	1412101137	
R114	R-CARBON,100 OHM,1/4W,5%	911 131007DA	
R115	R-CARBON,2.2M OHM,1/6W,5%	911 172207YA	
R200	R-CARBON,4.7K OHM,1/6W,5%	911 144707YA	
R201	R-CARBON,220 OHM,1/4W,5%	911 132207DA	
R202	R-CARBON,220 OHM,1/4W,5%	911 132207DA	
R203	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R204	R-CARBON,100 OHM,1/6W,5%	911 131007YA	
R205	R-CARBON,2.7K OHM,1/6W,5%	911 142707YA	
R206	R-CARBON,4.7K OHM,1/6W,5%	911 144707YA	
R207	R-CARBON,1K OHM,1/6W,5%	911 141007YA	
R208	R-CARBON,3.9K OHM,1/6W,5%	911 143907YA	
R209	R-CARBON,1.8K OHM,1/6W,5%	911 141807YA	
R210	R-CARBON,4.7K OHM,1/6W,5%	911 144707YA	
R211	R-CARBON,10K OHM,1/4W,5%	911 151007DA	
R212	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R213	R-CARBON,82K OHM,1/6W,5%	911 158207YA	
R214	R-CARBON,1K OHM,1/4W,5%	911 141007DA	
R215	R-CARBON,22K OHM,1/6W,5%	911 152207YA	
R216	R-CARBON,42K OHM,1/6W,5%	2001-000014	●
R217	R-CARBON,1.8M OHM,1/6W,5%	911 171807YA	
R218	R-CARBON,680K OHM,1/6W,5%	911 166807YA	
R219	R-CARBON,470K OHM,1/6W,5%	911 164707YA	
R220	R-CARBON,1.8K OHM,1/6W,5%	911 141807YA	
R221	R-CARBON,3.3K OHM,1/6W,5%	911 143307YA	
R222	R-CARBON,2.2K OHM,1/6W,5%	911 142207YA	
R223	R-CARBON,1K OHM,1/6W,5%	911 141007YA	
R224	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R225	R-CARBON,22K OHM,1/6W,5%	911 152207YA	
R226	R-CARBON,2.2K OHM,1/6W,5%	911 142207YA	
R227	R-CARBON,220 OHM,1/6W,5%	911 132207YA	
R228	R-CARBON,100 OHM,1/6W,5%	911 131007YA	
R301	R-CARBON,100 OHM,1/2W,5%(S)	911 131007FF	
R302	R-CARBON,100K OHM,1/6W,5%	911 161007YA	
R303	R-CARBON,180 OHM,1/2W,5%	911 131807FA	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚡ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
R304	R-M.O,1 OHM,2W,5%(S)	911 311007JF	
R305	R-CARBON,1K OHM,1/4W,5%	911 141007DA	
R306	R-CARBON,1.5K OHM,1/6W,5%	911 141507YA	
R307	R-M.O,1 OHM,2W,5%(S)	911 311007JF	
R308	R-CARBON,220 OHM,1/4W,5%	911 132207DA	
R309	R-CARBON,1.5K OHM,1/6W,5%	911 141507YA	
R310	R-CARBON,1.5K OHM,1/6W,5%	911 141507YA	
R311	R-CARBON,1.2K OHM,1/4W,5%	911 141207DA	
R312	R-CARBON,150K OHM,1/6W,5%	911 161507YA	
R313	R-CARBON,47K OHM,1/6W,5%	911 154707YA	
R314	R-CARBON,3.3K OHM,1/6W,5%	911 143307YA	
R401	R-CARBON,33 OHM,1/2W,5%(S)	911 123307FF	
R402	R-CARBON,180K OHM,1/6W,5%	911 161807YA	
R403	R-CARBON,470K OHM,1/6W,5%	911 164707YA	
R404	R-CARBON,100K OHM,1/6W,5%	911 161007YA	
R405	R-CARBON,150K OHM,1/6W,5%	911 161507YA	
R406	R-CARBON,220K OHM,1/6W,5%	911 162207YA	
R407	R-CARBON,100K OHM,1/4W,5%	911 161007DA	
R408	R-CARBON,100K OHM,1/6W,5%	911 161007YA	
R409	R-CARBON,22K OHM,1/6W,5%	911 152207YA	
R410	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R411	R-CARBON,7.5K OHM,1/6W,5%	911 147507YA	
R412	R-CARBON,100K OHM,1/6W,5%	911 161007YA	
R413	R-CARBON,150K OHM,1/6W,5%	911 161507YA	
R414	R-CARBON,1.8K OHM,1/4W,5%	911 141807DA	
R415	R-CARBON,100K OHM,1/6W,5%	911 161007YA	
R416	R-CARBON,1K OHM,1/6W,5%	911 141007YA	
R417	R-CARBON,68K OHM,1/4W,5%	911 156807DA	
R418	R-CARBON,82K OHM,1/6W,5%	911 158207YA	
R419	R-CARBON,2.2K OHM,1/4W,5%	911 142207DA	
R420	R-CARBON,1K OHM,1/4W,5%	911 141007DA	
R421	R-CARBON,180 OHM,1/4W,5%	911 131807DA	
R422	R-CARBON,470 OHM,1/6W,5%	911 134707YA	
R423	R-CARBON,470 OHM,1/6W,5%	911 134707YA	
R424	R-M.O,47 OHM,1W,5%(S)	911 324707GA	
R425	R-CARBON,1K OHM,1/6W,5%	911 141007YA	
R426	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R427	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R429	R-CARBON,1K OHM,1/6W,5%	911 141007YA	
R430	R-CARBON,4.7K OHM,1/4W,5%	911 144707DA	
R431	R-CARBON,5.1K OHM,1/6W,5%	911 145107YA	
R432	R-M.O,82 OHM,3W,5%(S)	911 328207LF	
R433	R-CARBON,330 OHM,1/2W,5%(S)	911 133307FF	
R434	R-CARBON,22 OHM,1/2W,5%(S)	911 122207FF	
R435	R-CARBON,33K OHM,1/6W,5%	911 153307YA	
R436	R-CARBON,1K OHM,1/6W,5%	911 141007YA	
R437	R-CARBON,100K OHM,1/6W,5%	911 161007YA	
R438	R-CARBON,22K OHM,1/6W,5%	911 152207YA	
R439	R-CARBON,47K OHM,1/4W,5%	911 154707DA	
R440	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R442	R-CARBON,12K OHM,1/6W,5%	911 151207YA	
R444	R-CARBON,10K OHM,1/6W,5%	911 151007YA	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚡ : ESD Caution)

Loc. No.	Description	Code No	Remarks
R454	R-CARBON,22 OHM,1/2W,5%(S)	911 122207FF	
R455	R-CARBON,5.6K OHM,1/6W,5%	911 145607YA	
R456	R-CARBON,560K OHM,1/6W,5%	911 165607YA	
R457	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R458	R-CARBON,39K OHM,1/6W,5%	911 153907YA	
R459	R-CARBON,1.8K OHM,1/6W,5%	911 141807YA	
R460	R-CARBON,22K OHM,1/6W,5%	911 152207YA	
R461	R-CARBON,4.7K OHM,1/6W,5%	911 144707YA	
R462	R-CARBON,68K OHM,1/6W,5%	911 156807YA	
R463	R-CARBON,470 OHM,1/6W,5%	911 134707YA	
R501	R-CARBON,2.7K OHM,1/4W,5%	911 142707DA	
R502	R-CARBON,1.5K OHM,1/4W,5%	911 141507DA	
R503	R-CARBON,18K OHM,1/4W,5%	911 151807DA	
R504	R-CARBON,100K OHM,1/2W,5%(S)	911 161007FF	
R505	R-CARBON,1.5K OHM,1/4W,5%	911 141507DA	
R506	R-CARBON,2.2M OHM,1/4W,5%	911 172207DA	
R507	R-CARBON,12K OHM,1/4W,5%	911 151207DA	
R508	R-CARBON,1K OHM,1/6W,5%	911 141007YA	
R509	R-M.O,100K OHM,1W,5%,63MM TAPING(S)	911 361007GF	
R510	R-CARBON,100K OHM,1/2W,5%(S)	911 161007FF	
R600	R-M.O,100 OHM,1W,5%(S)	911 331007GF	
R601	R-CARBON,1M OHM,1/2W,5%(S)	911 171007FF	
R602	R-M.O,220 OHM,1W,5%(S)	911 332207GF	
R603	R-CEMENT,3.3 OHM,7W,5%(SMALL)	2006-000002	⚠ ●
R604	R-CARBON,100K OHM,1/4W,5%	911 161007DA	
R605	R-CARBON,10K OHM,1/6W,5%	911 151007YA	
R606	R-CARBON,2.7K OHM,1/6W,5%	911 142707YA	
R607	R-CARBON,2.2M OHM,1/6W,5%	911 172207YA	
R608	R-CARBON,2.2K OHM,1/6W,5%	911 142207YA	
R609	R-CARBON,1.5K OHM,1/4W,5%	911 141507DA	
R610	R-CARBON,56K OHM,1/6W,5%	911 155607YA	
R611	R-CARBON,1K OHM,1/4W,5%	911 141007DA	
R612	R-M.O,10K, 1W,5%	911 351007LF	
R613	R-CARBON,6.8K OHM,1/4W,5%	911 146807DA	
R614	R-CARBON,120K OHM,1/2W,5%(S)	911 161207FF	
R615	R-CARBON,1.5K OHM,1/4W,5%	911 141507DA	
R616	R-M.O,100K OHM,1W,5%,63MM TAPING(S)	911 361007GF	
R617	R-M.O,100K OHM,1W,5%,63MM TAPING(S)	911 361007GF	
R618	R-M.O,68K OHM,3W,5%,63MM	911 356807LF	
R619	R-CARBON,6.8 OHM,1/4W,5%	911 116807DA	
R620	R-CARBON,1K OHM,1/4W,5%	911 141007DA	
R621	R-CARBON,100K OHM,1/4W,5%	911 161007DA	
R622	R-W.W,0.27 OHM,1W,5%	911 602707GV	
R623	R-M.O,8.2K OHM,3W,5%,63MM	911 348207LF	
R624	R-M.O,8.2K OHM,3W,5%,63MM	911 348207LF	
R625	R-CARBON,10K OHM,1/2W,5%(S)	911 151007FF	
R626	R-CARBON,22K OHM,1/6W,5%	911 152207YA	
R627	R-CARBON,100K OHM,1/6W,5%	911 161007YA	
R628	R-CARBON,390 OHM,1/6W,5%	911 133907YA	
R629	R-CARBON,3.3K OHM,1/2W,5%	911 143307FF	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚡ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
R631	R-CARBON,6.8K OHM,1/4W,5%	911 146807DA	
R639	R-M.O,47 OHM,1W,5%(S)	911 324707GA	
R640	R-CARBON,220 OHM,1/4W,5%	911 132207DA	
R641	R-CARBON,1.8K OHM,1/4W,5%	911 141807DA	
R701	R-CARBON,100 OHM,1/6W,5%	911 131007YA	
R702	R-CARBON,100 OHM,1/6W,5%	911 131007YA	
R704	R-CARBON,100 OHM,1/6W,5%	911 131007YA	
R705	R-CARBON,47K OHM,1/6W,5%	911 154707YA	
R706	R-CARBON,47K OHM,1/6W,5%	911 154707YA	
VARIABLE RESISTORS			
VR101B	VAR,NO-HANDLE,CAP,H-TYPE,RT,200 OHM,B,O,1W	913 432008BF	
VR101G	VAR,NO-HANDLE,CAP,H-TYPE,RT,200 OHM,B,O,1W	913 432008BF	
VR101R	VAR,NO-HANDLE,CAP,H-TYPE,RT,200 OHM,B,O,1W	913 432008BF	
VR102B	VAR,NO-HANDLE,CAP,H-TYPE,RT,50K OHM,B,O,1W	913 455008BF	
VR102G	VAR,NO-HANDLE,CAP,H-TYPE,RT,50K OHM,B,O,1W	913 455008BF	
VR102R	VAR,NO-HANDLE,CAP,H-TYPE,RT,50K OHM,B,O,1W	913 455008BF	
VR403	VAR,NO-HANDLE,CAP,H-TYPE,RT,2 KOHM,B,O,1W	913 442008BF	
VR406	VAR,NO-HANDLE,CAP,H-TYPE,RT,200K OHM,B,O,1W	913 462008BF	
VR407	VAR,NO-HANDLE,CAP,H-TYPE,RT,1 KOHM,B,O,1W	913 441008BF	
VR601	VAR,NO-HANDLE,CAP,V-TYPE,RT,500 OHM,B,O,1W	913 435008BH	
VR ARRY-1	H-TYPE,100K OHM*5.B.O.05W,.25F	2105-000001	
VR ARRY-2	H-TYPE,10K/5K OHM*5.B.O.05W,25F	2105-000002	
TRANSFORMER			
T401	COIL,TRANS,H-DRIVE,10MH/70UH,15%,SC-431VLI	BH26-30009A	⚠
T402	FBT,COLOR,FSA-14A003	BH26-10005A	⚠ ●
T601	POWER-TRANS	BH26-20007A	⚠ ●
OTHERS			
FG601	LEAD,3.15A,250V,5*20MM,CERAMIC	949 115105THNA	⚠
IS601	SOCKET,250V,3A,0.047(X),2200(Y),1.2MH,PCB	943 150034BA	
OP201	SPR-39MWW3,25MA,75MW/20MA,60MW	0601-000003	
PTC601	THERMISTOR,PTC,14 OHM,20%,220V,3PIN	1404-000003	
SK101	CRT SOCKET,PHL29-HIGH FOCUS,SMALL TYPE	935 720901AESA	
SW401	LEVER SWITCH,36V,0.2A,4PIN	933 110034TC	
SW601	PUSH SWITCH,SPST,5A/80A,250VAC,TV-5.4P	3403-000001	⚠ ●
FBR-CORE	FERRITE CORE,RING CORE	3301-000008	●
SG101	CAP SPARK-GAP,1KV,S-23	04569-001-110	
EYELET-2	EYELET,3.1*2.0*3.0 BSP SN	857 120032AB	
EYELET-1	MISCEL PIN-EYELET,BSS3-1/ZH.T0,25	857 120032AA	
FH601-2	FUSE CLIP,5.20*20MM,TAPPING	953 260023BC	
J1-115	JUMPER,WIRE BARE	955 005001AAAA	
J9	FITER,CORE,2.4UH,5.5MM,BEAD,0.032 OHM(S)	937 120211AA	
PCB	PCB,MAIN,247*330,FR-1.1,6T	BH41-10009A	
X201	RESONATOR,8 MHZ	941 210030AA	
P/CORD	CORD.POWER.SVT.1225V/7A.BK.6FT.SHIELDE.T.MARK	BH39-10001A	
CRT	ASS'Y,CDT ,M34KUN35*03,0.28D,14,S/S,L/F W/O	897 250159AA	⚠
CRT/GND	GND.471P/472P,660MM,400MM,2P,255MM	BH39-40052A	●
D.COIL	COIL,DEGAUSSING,115+/-1TS,0.45,13.70HM,1040MM	BH27-10001A	●
S/CABLE	15P-15P, DDC, IVORY, 1200mm	BH39-20002A	




(⚠ : Caution, ● : Specialty part for this monitor only, ⚡ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
CRT S/S	M34KUN35X01 CQB41** SAMSUNG SDD, VLMF	897 250159AA	⚠ 0.28 Northern
CRT S/S	M34KUN35X01(M) CQB41** SAMSUNG SDD, VLMF	897 250159AE	⚠ 0.28 Equator
CRT S/S	M34KUN35X01(R) CQB41** SAMSUNG SDD, VLMF	897 250159AD	⚠ 0.28 Southern
CRT S/S	M34KUK35X02 CQB41** SAMSUNG SDD, MPRII	897 250178CA	⚠ 0.28 Northern
CRT S/S	M34KUK35X02(M) CQB41** SAMSUNG SDD, MPRII	897 250178DA	⚠ 0.28 Equator
CRT S/S	M34KUK35X02(R) CQB41** SAMSUNG SDD, MPRII	897 250178EA	⚠ 0.28 Southern
MAIN-PCB ASSY	NORMAL CRT S/S TYPE	BH92-50009A	Normal
MAIN-PCB ASSY	MPRII CRT S/S TYPE	BH92-50033A	MPRII
C418	C-PP 252J 1.6KV	916 944250YJAH	Normal
C418	C-PP 272J 1.6KV	916 944270YJAH	MPRII


Note: This monitor has two different Main PCB Assembly types. The appropriate Main PCB Ass’y depends on the CRT and Deflection Yoke type. The Main PCB Assembly design is the same for both types; only a few individual parts are different. Be sure to refer to the list above for the appropriate code number.

9-4 Schematic Diagrams

Caution

- 1. The areas shaded or marked with  on the schematic diagram and parts list designate components which have special characteristics important for safety. Replace these parts only with parts identical to those in the original circuit or specified in the parts list. Before replacing any of these components carefully read the "Product Safety Notice."
- 2. When taking measurements, pay special attention to the following:
 - 1) Do not use your instrument between primary ground (symbol ) and secondary circuit.
 - 2) Do not use your instrument between secondary ground (symbol ) and primary circuit.



Warning



This equipment contains safety critical components. All parts shown with the  mark on the schematic are safety critical.

Replace safety critical parts with only manufacturers recommended parts. See parts list for exact replacements.

Note

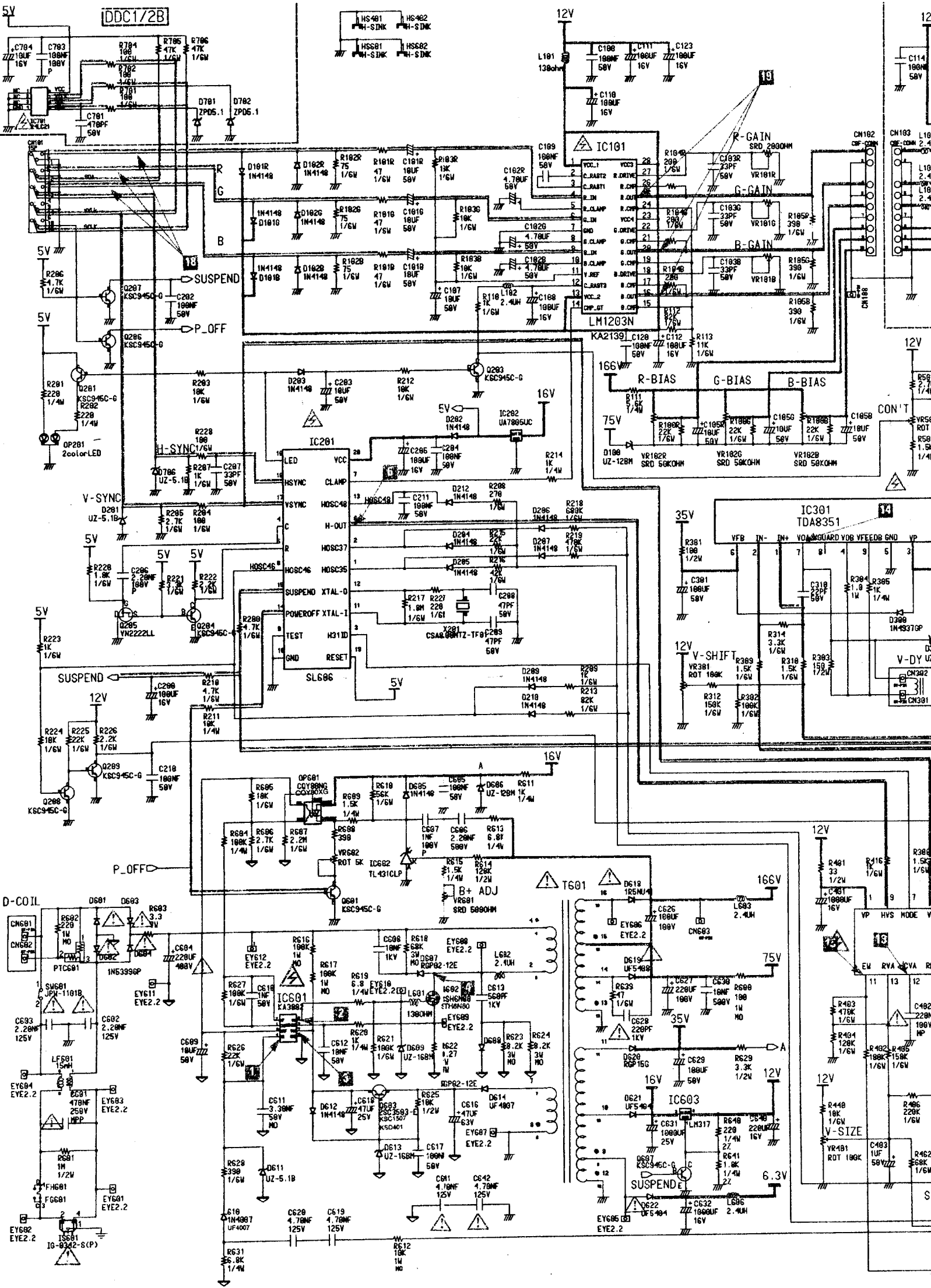
- 1. Resistance is shown in OHM. K = 1000, M = 1,000,000 and the rated power of resistors not noted in schematic diagram is 1/4W.
- 2. Capacitance is shown in μ F. Capacitances not otherwise noted are shown in pF ($1\mu\text{F} = 1,000,000 \text{ pF}$). Rated voltage of condensers not otherwise noted in schematic diagram is 50 V.
- 3. Abbreviations and Symbols

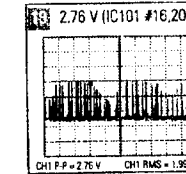
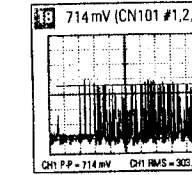
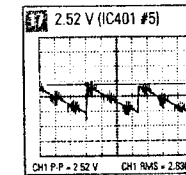
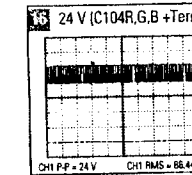
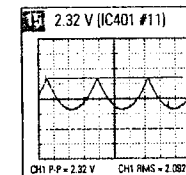
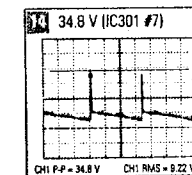
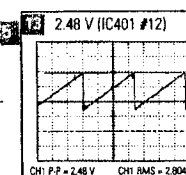
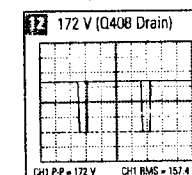
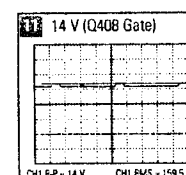
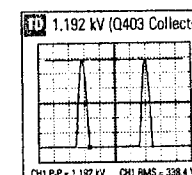
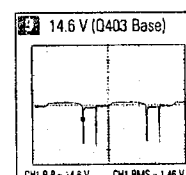
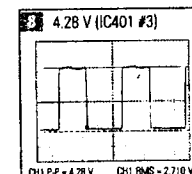
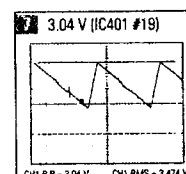
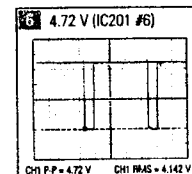
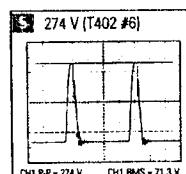
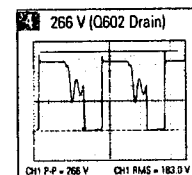
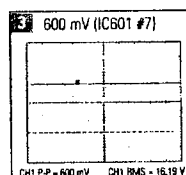
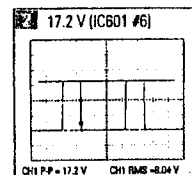
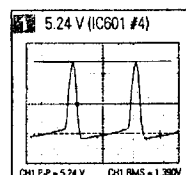
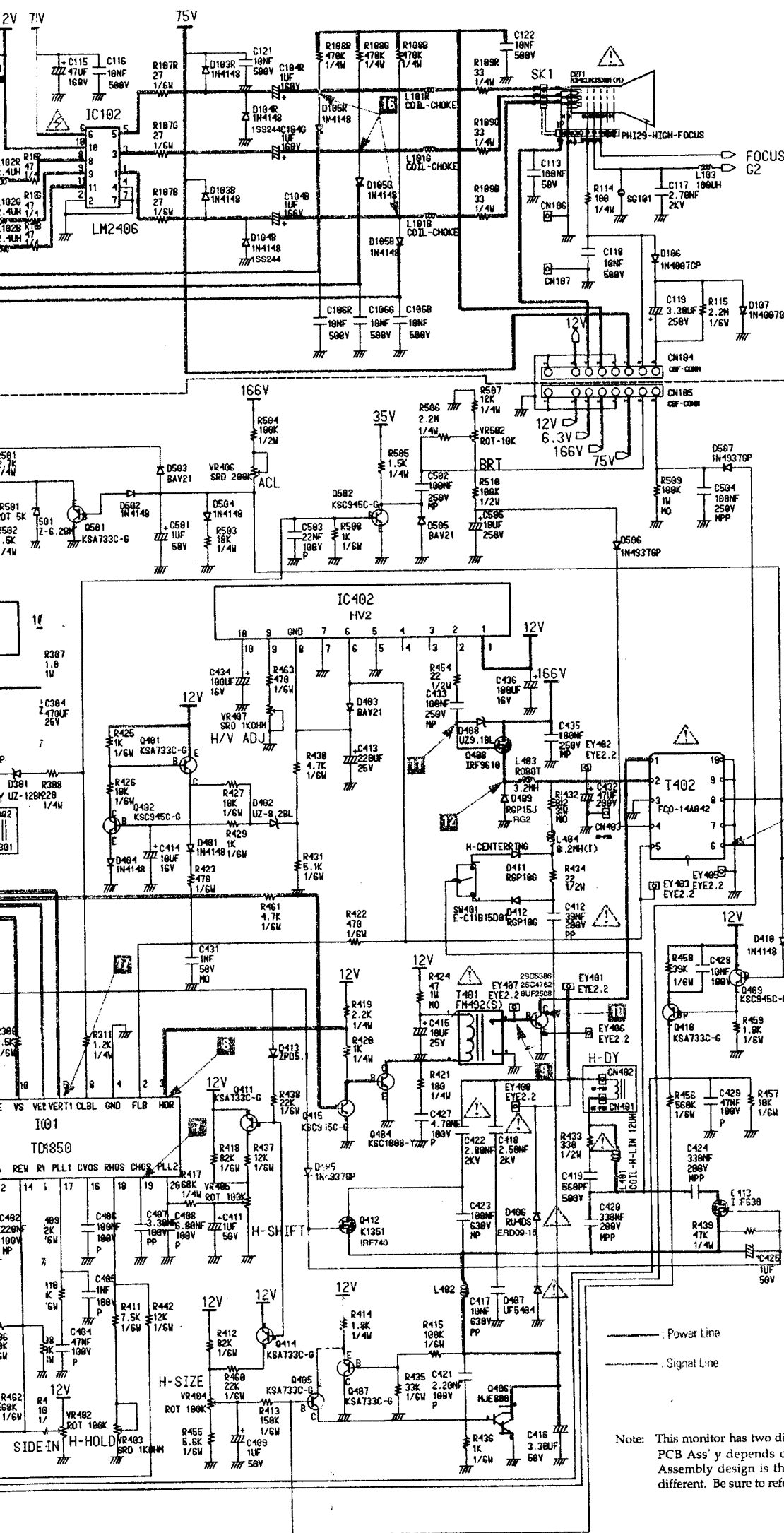
MO	R-METAL OXIDE	WW	R-WIRE WOUND
FU	FUSIBLE	C	R-COMPOSITION
CM	R-CEMENT MPP METAL POLYPROPYLENE	PP	C-POLYPROPYLENE
MP	C-METAL POLYESTOR	T	C-TANTALUM
P	C-POLYESTOR		COLD GROUND
	HOT GROUND		

- 4. The secondary voltage is read with an SSVM from the indicated point to cold ground ().
The primary voltage is read with an SSVM from the indicated point to hot ground ().
- 5. This schematic diagram is subject to change without notice.

9-4 Schematic Diagram

9-4-1 Main and CRT Socket, Schematic Diagram and Waveforms





_____ : Power Line
_____ : Signal Line

Note: This monitor has two different Main PCB Assembly types. The appropriate Main PCB Ass'y depends on the CRT and Deflection Yoke type. The Main PCB Assembly design is the same for both types; only a few individual parts are different. Be sure to refer to page 9-15 for the appropriate code number.